

Irish Underwater Council
Comhairle F6-Thuinn

Instructor*
(C.M.A.S. Moniteur *)

Student Handouts



INSTRUCTOR LEVEL ONE COURSE NOTES

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CFT Procedures Manual Reference: CFT 604



Instructor* (C.M.A.S. Moniteur *)

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What is an Instructor 1*?

An Instructor 1* is a Leading Diver who has been trained and examined in the theory and practice of teaching divers and snorkellers, both in and out of the water, according to CFT's diving and snorkelling modules.

Guide to Instructor 1* course

Brief

All candidates must attend an Instructor 1* Brief where the course will be outlined. Each prospective candidate will receive a handout containing the details including the dates of the course, the study topics and assessment dates.

COURSE OUTLINE

The course consists of two parts. Part one assesses theoretical knowledge and in-water skills prior to progressing. Part two of the course covers teaching and instruction techniques and includes an open water dive. Candidates must be successful in the theory and pool assessment prior to commencing part two.

Part One - Theory

Candidates have a period of self study following the Instructor 1* syllabus, to bring their knowledge up to the required standard – pitched at a knowledge level required to be an Examiner. Candidates are advised to arrange workshops and seminars for subjects they feel necessary.

The Theory Syllabus

Candidates should have an in-depth knowledge of the subject matter required to teach the following courses and CFT Modules:

- Trainee Diver (Diver*)
- Club Diver (Diver**)
- Diver Emergency Responder
- Cox'n Diver
- Rescue Diver
- Leading Diver (Diver***)

M1*'s should be familiar with the material covered in the Nitrox Diver, Extended Range Diver, Search and Recovery, and Gas Blending Modules. As further modules are developed these should also be studied. The level of knowledge required will enable an M1* to organise and dive with these divers and provide necessary first aid treatment.

Assessment

1. Theory

Four written papers will be taken at the end of the study period (no less than 4 weeks after the brief) under the following headings:

1. Physics – pass mark 60%
2. Physiology – pass mark 60%
3. General Knowledge – pass mark 60%
4. Decompression – pass mark 70%

2. Pool

All candidates will be assessed on the standard of their pool skills. All pool skills from D* and D** courses must be performed easily and confidently. The candidates will be assessed on each of the in-water skills they are asked to demonstrate – to include no less than:

- (i) Ditch and recovery of basic equipment
- (ii) Forward and backward rolls
- (iii) Towing with EAR
- (iv) Out of air exercise with buddy breathing
- (v) Ditch and recovery of full scuba equipment
- (vi) SMB deployment
- (vii) Methods of entries

Part Two – Teaching

Part two of the course consists of a number of lectures on teaching and techniques in both the class and in-water situations. The candidates will then practice these teaching skills by giving and preparing lectures and pool instruction.

Five-minute lecture

Each candidate will begin the course by presenting a previously self chosen topic for no more than five minutes. The first session of the course will cover all the lectures to be given to the candidates.

Lectures

1. Introduction to CFT modules and standardised practical skills
2. Principles and Theory of Teaching
3. Preparation, Presentation & Planning of a Lecture
4. Visual Aids
5. In water Instruction
6. Instructor Responsibilities

Pool

The Course Director will organise this first pool session as a demonstration of organising and teaching in the pool to the candidates. In this first session each candidate will also instruct a group in the pool in at least one snorkelling and one scuba skill.

Modules

The following modules can be given:

1. Diver Emergency Responder Instructor module
2. Cox'n Instructor module

These two modules may be taken by M1* candidates as part of the M1* course. They may be taken at any other time only by a qualified M1*.

Candidate instructional skills

The candidates will practice their instructional skills by:

- (i) Giving lectures
 - (ii) Organising and teaching in the pool
 - (iii) Open water dive
- (i) Lectures – minimum 4 per candidate
Any of the module lectures from D*, D** or Rescue can be used.
- (ii) Pool – minimum three pool sessions (3 x one hour)
- (iii) Open water dive – an open water dive is to be done to practice demonstrating a skill from the Diver* or D** training modules.

Guide to M1* exam

Final Assessment

An appointed Jury will examine the candidates under the guidance of a Jury President.

The final exam consists of four elements:

- (i) Presentation of module lecture
- (ii) Presentation of non-module lecture
- (iii) In-water practical instruction (confined water)
- (iv) In-water practical instruction (open water)

Limitations after Course

An M1* is not qualified as an examiner, except of snorkel and trainee divers at club level.

An M1* may assist on suitable regional examinations under the supervision of examiners.

An M1* may attend a Diver Emergency Responder Instructor and/or a Cox'n Instructor course, if successful can then assist in the provision of Emergency Responder and Cox'n courses.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

Introduction to CFT Modules

This lecture will cover an introduction to the CFT modules and how they are used. The lecture will also cover the standardised practical skills and the teaching format to be used.

Introduction

The CFT modules have been developed in order to standardise the teaching of the various diving and snorkelling courses and to make certain that the standards are uniform. This means that in Irish Underwater Council clubs the same basic information will be taught, enabling divers and snorkellers to be safe in the knowledge that standards will be universal.

The method of teaching pool skills in a uniform way has also been introduced. This will help, not only in the training of new divers, but will also aid examiners travelling around the country, as they will know what to expect. This does not mean that alternative methods are incorrect, but that a standard method has been adopted to give nationwide uniformity.

The Modules

Each CFT course is taught using a structured module, that contains all the theory required for that course. The module contains lesson plans and slides/ powerpoint for Instructors, handouts for student and there may be extra information e.g. attendance sheets, details of practical work or even extra information for Instructors.

The modules are presented in two formats, hard copy (printed) and soft copy (on CD to present from computer). The basic structure is the same whichever method you choose.

Details for accessing and using the CD are supplied with the disc. Further information can be found in the documents 'Connecting Laptops to Projectors' and 'Using PowerPoint'. Both these presentations are available for anyone who wants to learn more.

The contents of the module are listed at the front – usually a list of the lectures. If using the hard copy, decide what lecture you need and turn to the correct page. If you are using the CD it offers two choices – scuba or snorkel courses and then the choice of adobe (lesson plans, OHP slides and handouts) or PowerPoint (slides) for the content of the lecture.

Each lecture in the module follows the same format:

Adobe Acrobat file on CD / text of lecture in printed copy

1. Title with contents and lecture objective
2. Instructor checklist detailing duration of the lecture, the equipment needed, and a reminder to sign log books
3. Brief lesson plan (BLP) + slide numbers
4. Full lesson plan (FLP) + slide numbers
5. Student questions and answers (in some modules)

The slide numbers correspond with both OHP and PowerPoint slides.

PowerPoint slides (CD only) / Overhead projector slides (CD and printed copy)

1. Series of numbered slides
2. Each slide ties in with the text on both the FLP and the BLP

NB: OHP slides require printing on to acetates

Student Handout (in Adobe Acrobat file on CD or separate printed handout)

1. Handout is a copy of the text from all FLP to avoid errors
2. All lectures (rather than individual) given out in bound format

Some Instructors give out the individual notes at the lecture, but this practice is largely superseded by the production of bound copies of the student handout.

For the Trainee Diver and Club Diver there are several other documents such as briefing cards, pool exercises and attendance records. It will be necessary to look through each module to familiarise yourself with its contents.

To use the module

Decide the lecture to present

Locate the lecture on the CD or in the printed version

Open the adobe file (or printed copy)

Check the title page for contents and lecture objective.

Use Instructor checklist to plan the length of the lecture and the equipment required

E.g. for Out of Air lecture you will need:

- a) Data projector and laptop or OHP
- b) CD or Overhead slides

- c) Brief Lesson Plan (BLP)
- d) Full Lesson Plan (FLP)
- e) Sufficient number of student handouts
- f) Pony bottle
- g) BC cylinder
- h) Cylinder
- i) Octopus regulator

There is a reminder to sign the student logbooks at the end of the lecture.

Check through the BLP to make sure you are familiar with the lecture

Thoroughly read the FLP and research around the subject for areas you may be unsure of.

Locate the slides (PowerPoint or acetates)

Self present the lecture to check timings and ensure smooth running, especially important if the lecture contains demonstrations. It is very easy to forget the time, especially if the class are interested, but the whole lecture should be covered.

Standardised pool skills

Each of the skills taught in the pool for the D* course have been set out in a standard format, with step-by-step instructions for each skill. By teaching skills to a standard format examiners will be able to assess an individual diver fairly, with the knowledge of how the skill was taught. Up until these standard skills were introduced an examiner could come across several methods of performing the same skill. It should be emphasised that there are other ways of teaching some of the skills and these are not incorrect, but these standards are the methods adopted by the Irish Underwater Council to be taught in the D* and D** modules.

The standard skills are contained in the Appendix on individual sheets to facilitate copying and laminating for use in the pool. It is a good idea to have these to hand until you are familiar with the method of teaching.

Appendix

The appendix includes the standardised pool exercises and the course attendance sheets. The latest editions of other forms and codes of conduct can be obtained from the CFT website or the latest disc.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

Principles and Theory of Teaching

This lecture will cover the basics of what is expected of you and why Instructors are required. Then we will examine the process by which people learn including the use of senses and presenting information in a step-by-step manner. The lecture continues with a brief look at considerations for staging and presenting lectures in and out of doors – both are common and necessary for successful dive training. We will finish with the elements of a good Instructor.

The Basics

To be effective, an Instructor must be fully aware of the principles of good instruction. It is a vast subject, which can only be covered in outline in the time permitted here. Therefore, each candidate must accept:

- That he/she has to imitate and assimilate everything they can from the Instructors associated with the course
- That continued study and practice of the subject is essential. Instructors should never assume to have learnt all that is needed, even after being successful on this course.

Like the students they teach, a successful Instructor will be aware of the value of "Lifelong Learning".

Theoretically the knowledge a diver requires can be read from any of the CFT modules. Therefore, you could assume there should really be no need for an Instructor.

In practice, we know that we this assumption is an incorrect one, because a manual cannot pass on enthusiasm for a subject, nor knowledge gained through experience.

The quality of instruction given must be of the highest standard because, within the sport of diving, lives will depend on the teaching ability of the Instructor.

The Learning Process

Learning is a relatively permanent change in behaviour that occurs as a result of practice or experience.

Learning is a continuous cycle where the learner;

- Has an experience (e.g. mask clearing)
- Reviews what has happened (mask won't clear properly)
- Comes to conclusions (lifting mask seal too far up)
- Plans (decides to try it while not lifting skirt as high)

Adults are normally motivated to learn, having made that choice, and are not forced to attend lectures or lessons. Adults want to learn by doing and they want the opportunity to participate. They want their learning to be interesting, stimulating and fun.

It is important for the Instructor to realise that people have different ways of learning. For some people their learning is affected by past experiences, a desire to learn and even by you, the Instructor.

The principles of good and effective instruction apply equally to lectures or pool sessions. The Instructor must have a sound grasp of these principles to be successful in any teaching environment.

The Senses

All learning is received through use of the five senses i.e. sight, hearing, touch, taste and smell.

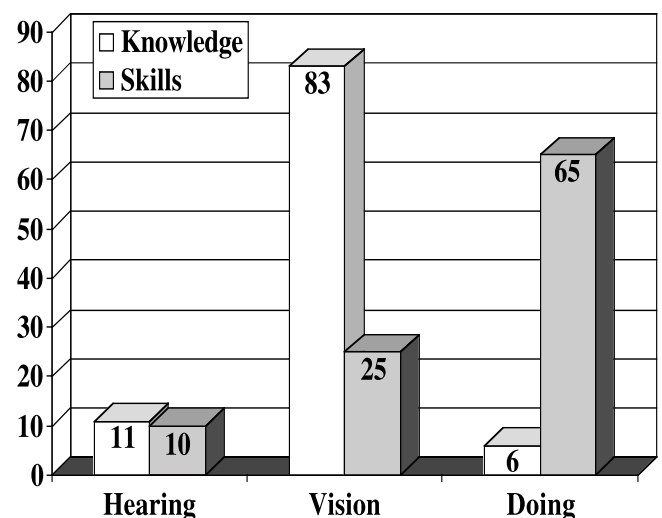
Sight and hearing are normally the most highly developed senses and most learning is derived from them. However touch is also important in our teaching, and this is one sense that will be utilised during practical equipment lessons or in pool work.

It is estimated that knowledge is assimilated through the senses in the following proportions: -

Vision 83%

Hearing 11%

Other 6%



This creates problems for Instructors if they are to succeed in attaining a certain skill level in the students.

What is an Instructor 1*?

An Instructor 1* is a Leading Diver who has been trained and examined in the theory and practice of teaching divers and snorkellers, both in and out of the water, according to CFT's diving and snorkelling modules.

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Brief

All candidates must attend an Instructor 1* Brief where the course will be outlined. Each prospective candidate will receive a handout containing the details including the dates of the course, the study topics and assessment dates.

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The course consists of two parts. Part one assesses theoretical knowledge and in-water skills prior to progressing. Part two of the course covers teaching and instruction techniques and includes an open water dive. Candidates must be successful in the theory and pool assessment prior to commencing part two.

Part One - Theory

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The quality of instruction given must be of the highest standard because, within the sport of diving, lives will depend on the teaching ability of the Instructor.

The Learning Process

Learning is a relatively permanent change in behaviour that occurs as a result of practice or experience.

Learning is a continuous cycle where the learner;

- Has an experience (e.g. mask clearing)
- Reviews what has happened (mask won't clear properly)
- Comes to conclusions (lifting mask seal too far up)
- Plans (decides to try it while not lifting skirt as high)

Adults are normally motivated to learn, having made that choice, and are not forced to attend lectures or lessons. Adults want to learn by doing and they want the opportunity to participate. They want their learning to be interesting, stimulating and fun.

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The principles of good and effective instruction apply equally to lectures or pool sessions. The Instructor must have a sound grasp of these principles to be successful in any teaching environment.

The Senses

All learning is received through use of the five senses i.e. sight, hearing, touch, taste and smell.

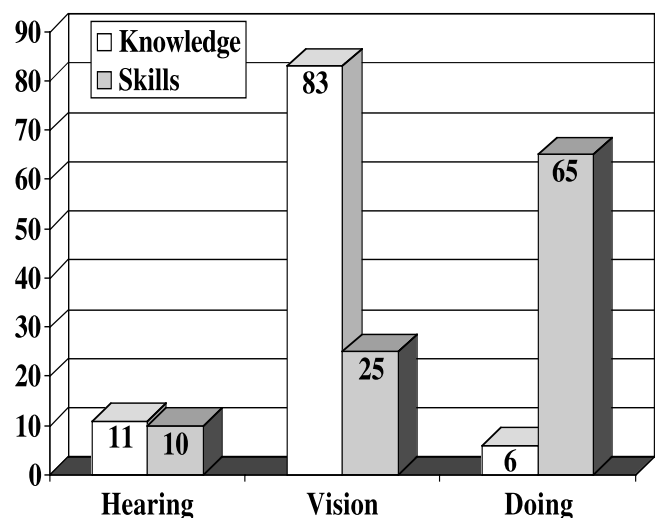
Sight and hearing are normally the most highly developed senses and most learning is derived from them. However touch is also important in our teaching, and this is one sense that will be utilised during practical equipment lessons or in pool work.

It is estimated that knowledge is assimilated through the senses in the following proportions: -

Vision 83%

Hearing 11%

Other 6%



This creates problems for Instructors if they are to succeed in attaining a certain skill level in the students.

However, by contrast, physical skills are learnt using the senses in the following proportions: -

Doing 65%

Vision 25%

Hearing 10%

This highlights the importance of practical sessions such as in-water teaching and workshops.

Activity lessons such as using a compressor, analysing Nitrox or driving a boat tend to be more successful.

Remember the following phrase, which aptly describes how people learn:

"What I hear, I forget; what I see, I remember; what I do, I understand"

Step by Step

Learning is a process of association with what we already know. Therefore all lessons or lectures should be presented in a correct and logical sequence.

It is important that the reason "Why" the lecture is important is clearly established at the start.

Then the introduction should give a clear reference to the previous lesson or lecture.

Links should be established with the learners existing knowledge of a concept, i.e. what has been learnt previously, with the focus placed on highlighting the personal relevance of the concept. If a concept can be visualized using personal experience or relevance this becomes learning by 'doing', which is more likely to be remembered.

Learning should proceed in a step by step logical sequence, and where possible be re-enforced by practice both after each step or phase and, again, at the end of the lesson or lecture.

This can be remembered by the phrase:

"Tell them what you are going to tell them; Tell them; then tell them what you told them"

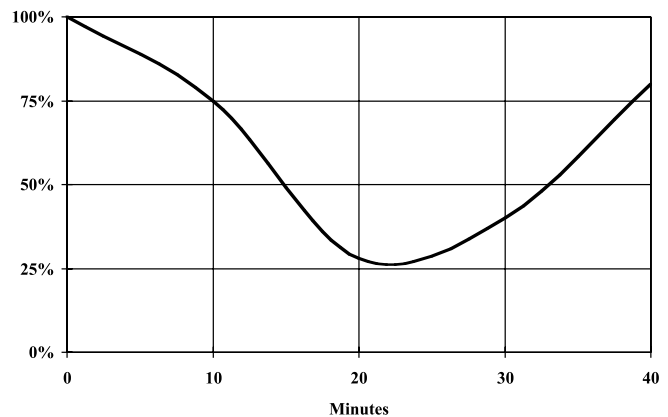
A lecture situation provides limited opportunities for "practice". Therefore questioning or discussion must replace the "practice". This re-enforces the topics of the lecture so that a consensus of understanding can be reached between the teacher and the learner.

Imitation

This is a vital component in instruction. Where an Instructor earns and holds the confidence and attention of his pupils, there will often be an unconscious imitation of his methods and delivery. New Instructors should be aware of this, as mannerisms can be over-emphasised. Identify the elements that kept your attention, and remember the type of delivery that was not so effective.

Attention Span

An Instructor must be wary of the attention span of his class, particularly in a lecture situation. The attention of the class is initially at a high level at the start of a lecture, this falls towards the mid point. As the pupils realise that the end is near, where there may be questions asked and answers required, the attention of the class rises. By reinforcing the knowledge throughout the lecture with questioning or demonstrations, the class remains alert. The Instructor can introduce anecdotal experience or humour to keep the attention of the class.



It is the Instructor's duty to ensure that a drop in attention is reduced as much as possible.

Staging and Presentation

The staging and presentation of a lecture in particular has a great bearing on holding the attention of a class. The positioning of the class for the lecture will depend upon the level of interaction required; it may just be the class need to see the board or screen or it may be that the class are required to participate in some practical aspect of the lesson. The presentation method of the lecture will again be determined by the nature of the topic. The planning and preparation of the lecture has to be thorough in all respects in order to ensure the information is presented in the best possible manner.

Indoors

An Instructor is giving a performance - he is "on stage" and must attempt to get the class to participate in all possible ways for the performance to be effective. To do this, the Instructor must consider the following:

Heating - a class in a freezing room will not be paying attention

Distractions - the class should be so placed as to focus on the instructor and his instruction

Lighting - the class must be able to see clearly, so the lighting must be adequate and from the correct angle.

Seating - this should be sufficient and comfortable, even if not in use for the whole lesson. Tables for writing are highly desirable.

Acoustics - try to get as close to the class as possible if the acoustics are bad, or select a portion of the room where the problem may be less. A full room gives better acoustics than an empty one.

Outdoors

Only a small number of lectures should be conducted in the open air. Remember, an indoor location will always give greater control during a lecture. Where a lecture has to be given in the open air, the following points should be considered. These can be contradictory depending on the conditions.

Seating – you can make use of sloping ground, rocks, steps etc. to enable your class to sit and take notes.

Heating – the class must be adequately dressed for the conditions and the Instructor must allow warm-up breaks if the temperature is low.

Lighting - the sun should not be in the eyes of the class or the Instructor, but should be at an angle to both.

Wind - do not have your words lost in a strong wind but use the wind to carry your voice to the class

Distractions - the class should be placed so as to avoid seeing any distractions, such as passing traffic, boats, people etc. The Instructor should position the class to facing a wall if this is available.

Visual Aids - these require careful selection for outdoor lessons; a flip chart or black/white board are the most suitable.

The Successful Instructor

The Instructor is a role model for the students, so every Instructor must ensure that their attitude is right.

The successful Instructor must know, understand and practice all or as many as possible of the following characteristics:

Appearance

The Instructor should set an example to the class who may imitate him. Look professional.

Knowledge of the subject

Advance notice of the lecture allows an Instructor time for study, practice, arrangement of visual aids, preparation of demonstrations and questions. The Instructor must have an excellent knowledge of the lecture subject in order to successfully impart the information to students. It cannot be emphasised enough that you must know the subject that you are lecturing on. In some cases you will be the first Instructor to teach candidates, and you must be capable of answering their questions.

Enthusiasm

Convey your own enjoyment and interest of the subject to the class. Remember, you are putting on a performance. Within the sport of diving enthusiasm is relatively easy to convey as most Instructors are voluntary and therefore would not be teaching if the subject did not enthral them.

Voice

Rhythm - speak smoothly using shorter rather than longer sentences.

Words - use simple words, breaking down technical terms. Do not try to show off.

Speed - speak more slowly than normally, this gives everyone a chance to hear.

Volume – speak neither too softly nor too loudly, with enough volume for all to hear easily.

Pitch - a very deep voice tends not to carry well, a high-pitched voice carries better.

Talk – direct speech towards the class, not the notes, board or screen. Practice projecting your voice to the back of the class.

Equality

An Instructor must treat all people fairly, regardless of race, religion, social background, lifestyle etc.

Attitude

Instructors must be firm and fair, and show no favouritism or bully tactics. Make allowances whenever needed. Do not bluff. If asked something that you cannot answer, promise to find out after the class and then tell the class. If it cannot be determined immediately make sure to get back to the class at a later date. Do not be afraid to ask for opinions, there may be someone in the class that has an expert knowledge in a certain area.

Eye Contact

Maintain eye contact with the class. Do not look at the wall, screen or ceiling.

(At this stage the Instructor to demonstrate the "lighthouse technique":

Get everyone to raise his or her hands. Tell them not to drop their hands until they have received 3 seconds of eye contact from the Instructor. As the Instructor speaks they scan the room like a lighthouse and people begin to lower their hands.)

Self-Criticism

Try to listen to yourself as you speak. By assessing your progress continuously you will see if there are blank stares or puzzlement in the class. If this happens stop, ask and re-state the information to clarify.

Mannerisms

Repeated actions and words can be distracting to a class. Avoid em's, ah's and ok's etc as much as possible. Be wary of repeating phrases, often due to nervousness.

Humour

Humour, where relevant, is good for retaining class attention. If you don't have the ability to be funny, don't try.

Punctuality

Start on time, finish on time (SOTFOT). It is courteous to your class and to the next Instructor waiting to get started. It also demonstrates the right attitude for an Instructor.

"After Sales Service"

Follow up on any point raised in class, and make sure to inform them the following week if necessary. Announce your availability and willingness to help either the class or individuals at any time during the course.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

Preparation, Presentation and Planning of a Lecture

In the last lecture, you covered in outline the principles and theory of teaching.

Now you will learn how to apply these principles to preparing for and presenting a lecture or practical lesson. We will also look at how to plan a lecture from scratch, applying the principles of teaching.

Preparation for a lecture

The Instructor must have a detailed knowledge of the subject, and should always prepare work, either the lesson plan or the practical demonstration, as if it were the first time to deliver the particular lecture.

The Instructor needs to prepare for the lecture in a similar structured manner to teaching the lecture itself. This can be divided into four sections:

- Preplanning
- Practical Demonstration
- Presentation
- Question Techniques

Pre-planning

Location

The Instructor should know where the lecture will be given and the facilities available. If it is at an unknown location you should try to do a reconnaissance in advance in case there may be difficulties i.e. plug outlets etc. As most lectures are part of a course the course organiser will usually have all this information. A course organiser would prepare all this information prior to running the course. This information will usually be sent out to each Instructor teaching on the course.

Always get to the location well in advance of the class, not just because of the need to organise the room, equipment, and visual aids but also to greet the class and to record their attendance.

In setting out the seating have in mind the factors of class comfort as outlined in the previous lecture.

Lecture Topic

This must be known in advanced and the Instructor must have an excellent knowledge of the subject being taught. This is well covered in Principles of Teaching lecture. It is a good idea to be able to refer back to a previous lecture to link the course together.

Class size

The Instructor will need to know the numbers attending the lecture in order to provide the class with handouts and to provide, if needed, adequate equipment for practical demonstrations.

Visual Aids

The type of visual aids best suited will depend upon the facilities provided and the type of lecture to be given, i.e. indoors or outdoors; practical or theory. It is no use turning up with OHP acetates to find there is only the means to present using a laptop and data projector. It is also wise to have back up visual aids, and to consider presentation of the lecture with no visual means at all, e.g. in a power cut.

Detailed use of visual aids will be covered in the next lecture.

In a lecture setting, remember:

- A maximum attention span of 40 minutes applies in a lecture
- Do not try to teach skills
- Interaction with students can be a useful teaching opportunity.
- Well prepared visual aids are of great benefit

Demonstrations

Demonstrations used should be chosen for their suitability for the occasion and the lecture topic. To be effective any demonstration must be as near perfect as possible. The Instructor must practice all demonstrations in advance; this is useful to ensure the equipment is in correct working order.

In order to cover a wide a range as possible the demonstration may involve a piece of equipment the Instructor is not familiar with using. If it is something you not familiar with or are not personally good at, get an assistant to perform the demonstration under your guidance. Some lectures, i.e. compressors or outboard engines may actually require the assistance of a helper. If the Instructor is not distracted by having to concentrate on the demonstrations it is often easier to keep control of the class. There is nothing wrong with enlisting help and it may be very beneficial.

In lectures where items of equipment are shown and explained it can be useful to enlist the help of members of

the class, this not only keeps the attention of the class but also re-enforces the learning.

When teaching skills in a practical session use the five step skills teaching procedure.

- (i) Be confident and competent with the skill you are demonstrating.
- (ii) Ensure adequate time for students to practice.
- (iii) Do not teach too many skills in one session.
- (iv) Make sure every student practices every skill.
- (v) Do not give more lectures during the practical.

Presentation

At the beginning of the lecture introduce yourself; giving your grade, background and state your question policy. It is important that the class know of your background and experience as this gains their confidence in you as an Instructor.

The title and objective of the lecture should be stated together with the time allotted to the lecture. It is a good idea to have a watch or timer beside you in order to keep a watch on the timing of the lecture.

Certain ground rules should be stated here, i.e. no phones, location of fire exits.

The "Why?" of the particular lecture must then be stated clearly. By stating the reason for the lecture this uses existing knowledge helping students to understand why it is important for them to know this topic.

Maintain eye contact, and speak to the whole of the class, not just one part or indeed any one individual. Speak confidently and try to listen to what you are saying.

Do not show favouritism and in particular do not persecute any individual who struggles to understand or who may be a slow learner.

Do not try to bluff. If you cannot answer a question, merely offer to get the answer after class, or next week. Make sure that you follow up.

The lectures are set out in a logical format, beginning with an introduction including the object of the lecture and what it will cover. Each of the points is then expanded on through the lecture in the step-by-step manner, some requiring further explanation and some practical demonstration. As an Instructor you need to be able to follow this in order to successfully impart the knowledge to the students. The lecture finishes with a summary of what has been covered and then there are set questions you can ask in order to assess the level of understanding of the class.

Instructors often finish with asking the class if they have any questions, important depending on your question policy.

Question Policy

Decide whether you will permit questions during the lecture or whether they must be held until the end. This is your question policy stated at the beginning of the lecture. If someone has a problem concerning their understanding of the lecture, then they should be advised to ask questions immediately. If the student is not allowed to ask in this circumstance they may well not listen to the rest of the lecture and become a disruptive influence. It is also common when one student asks a question that two or three more are actually having the same problem.

Do not permit any questions or discussions that have no connection with the particular subject in hand. You can say "This will be covered later on" etc. However the Instructor should recognise during the preparation of the lecture where topics overlap and ensure that either the students have or will be covering the subject. It can be a measure of comprehension if the class understands previously topics covered. Remember you have a limited time for your lecture

When asking a question, you must address the entire class. Give a little time for each to prepare his answer, and then ask an individual by name. It is not good practice to allow the class in general to answer. The rule is: -

Ask	Put the question to everyone.
Pause	This allows them to prepare the answer.
Nominate	By name or point to the individual.

If you wish to double up on the number of questions, or really test whether your lecture was successful, you can on getting an answer, ask if it was correct i.e. ask someone else:

Ask	everyone "Is this right"
Pause	Look around.
Nominate	Select another member of the class by saying "what do you think"

Once the set questions are completed always ask the class if there are any more questions. Always offer to be of help in the future if a problem arises. This reinforces the confidence of the class.

Finally

When the lecture is over, make sure you leave the room or site as you found it. Clean the black or white board if used, return the seating to its original position and pack up any equipment you used. If you have had equipment for demonstration get help from the class to take it out, this often leads to further discussions.

Planning a non-module lecture

The preparation of a lecture from scratch demands a little more thought, planning and time. However, now that you are somewhat familiar with the module, the formula is easy to follow.

Planning the lecture

Once you have identified the topic you need to decide

- (i) What the students have to know
- (ii) What the students should know
- (iii) What is nice to know

Objective

The objective of the lecture states in a single sentence or short paragraph what knowledge the lecture aims to impart.

Introduction

This establishes the "why" of the lecture. It should be well defined, short and to the point informing the students why it is necessary for them to have this knowledge. The introduction will also include the main point that will be covered in the lecture

Body of the lecture

This is where your research into the topic is important. You need to decide what you want to teach, how much you should cover. Remember to build on information and knowledge previously gained.

Often it is impossible to include all the points you discover during your research and you should not try. You must choose the aspects that are the most important and will give the students the most information in the time allotted, bearing in mind the more interesting facts will hold the attention of the class.

Summary

The summary is basically the list of the main points covered in the lecture, but you can summarise what was said. This re-enforces the learning.

Assimilation

Preparing a list set questions to ask the class after the lecture will give you an idea of how much the class have retained and understood. The questions should cover all aspects of the lecture topic.

Presentation of the lecture

Now the lecture is planned you need to decide on the method of delivery. You are staging a presentation and will need to think of how this may best be done to fit with the topic i.e. lecture, role-play, discussion, demonstration. Do not be afraid to use different methods

The class will have to be motivated. You need to think of ways of involving the class in activities and demonstrations as well as looking after their comfort.

You require your introductory speech: who you are, your grade, experience and background and the timing for the lecture. This will apply to whatever lecture you are giving, it is often handy to have your own acetate or slide with this information as a prompt.

Sequence of Instruction

Once the lecture is planned, check to see if the different aspects of instruction are fulfilled. For this we can use Gagne's nine events of instruction:

1. Gain attention: relate to everyday life
2. Objective: Tell learners the importance of the lecture
3. Recall previous learning
4. Give the lecture
5. Demonstrate
6. Get them to do tasks
7. Provide feedback
8. Assess
9. Practice

The lecture must move in a logical sequence. It should be broken down into manageable stages.

For practical instruction you should follow this 6-step sequence;

- Demonstrate silently
- Get class to talk through
- Students demonstrate
- Feedback
- Practice
- Test.

The Lesson Plan

Once the lecture is planned you need to produce a lesson plan. This should be designed in such a way that any Instructor can pick it up and follow a logical sequence of events. Whether it is a lecture or a practical subject, it should have the distinct stages:

Head / Introduction: This must include the objective, the reason why.

Body / Main text: This contains the bulk of the lecture and should be broken down into stages.

Tail / Summary: The summary and questions fall into this part.

This lesson plan is for the guidance of the instructor and should be consulted when necessary. It should be consulted openly and regularly throughout the session, taking time to read it carefully. The lesson plan should be placed on a table or podium where the Instructor can see it easily. It is a good idea to place a watch beside it as a reminder of the timing for the lecture.

Two types of lesson plans are included in the modules; the brief lesson plan and the full lesson plan.

The brief lesson plan can be very useful for an experienced Instructor as it acts as a point-by-point guide matching with the slides to help the lecture progress in a logical sequence. The full lesson plan contains the entire text for the lecture giving more detail for the matching

the slides. It depends on the individual Instructor as to their preference.

The text from the full lesson plan is the basis for the student handouts.

The Student Handout

It is necessary to give out a handout containing the text of the lecture. If you were to expect the students to take

notes the lectures would take considerably longer, plus the attention of the students would be concentrated on taking the notes. There would be the danger of the information not being correct – not an ideal circumstances for diving. By providing the students with the handout, they can listen to the lecture, ask questions and have the correct information to refer back to at a later stage. The detail on the handout will be similar to the detail in the full lesson plan.



Visual Aids

Objective

The objective of this lecture is to introduce the instructor to the techniques required to prepare and deliver a visual presentation. There are many mediums which can be used to assist the instructor with his/her lecture. With the modules, C.F.T. chose PowerPoint presentation software in conjunction with a data projection system as the primary method of communicating diver training. An alternative system using the overhead projector (O.H.P.) and transparencies has also been catered for. We will therefore, only briefly touch upon the other mediums and concentrate on the techniques employed to enhance the presentation of information prepared in the module format.

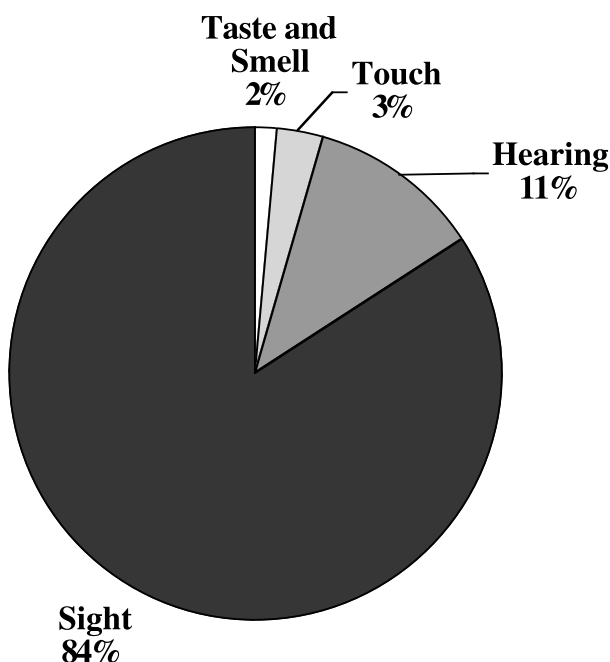
This approach has two distinct advantages:

1. Improves the individuals level of comprehension and retention.
2. Standardises the level of diver training by ensuring the same information is passed on to trainees regardless of their location.

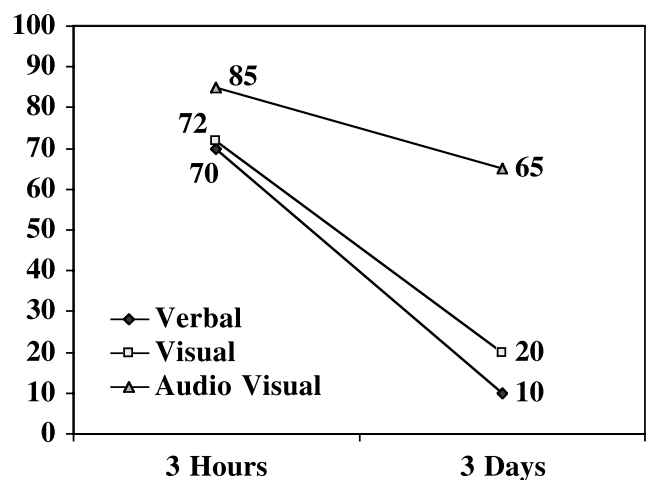
Learning Theory

By our nature, we humans have a short attention span, we are always thinking about something else, as a result we are basically poor listeners.

We learn through our senses, 83% through sight, 11% by hearing, 3% by touch and 1.5% via taste and smell. We assimilate visual information 60,000 times faster then we assimilate printed copy.



The sole purpose for using visual aids is to get the message across. Effective visual aids will significantly improve comprehension and retention. Studies show, that the level of information we retain decreases with time. After 3 hours, we remember 70% of verbal information, 72% of visual information and 85% of audio visual information. After 3 days we will retain only 10% verbal and 20% visual information, however we retain 65% of information shown and explained in the audio visual format.



Developing the Presentation

When developing a presentation set the standard, research and prepare the necessary information, analyse its content, prioritise between the need to know and the nice to know information. Nice to know information can be used to inject some humour into the lecture. Organise the information into a meaningful, logical sequence.

Keep the slide simple and uncluttered. Each visual should be used to project a single message/idea. Condense thoughts to paragraphs, paragraphs to sentences, sentences to phrases, phrases to key words.

A good rule of thumb is to arrange your bullet points so as to have no more than six words per line and no more than six lines per slide.

Types of Visual Aids

Visual aids can be divided into three categories:

Presentation: used for the display of information. These include blackboard, whiteboard, flip chart, overhead projector, slide projector, data projector/computer and video.

Interaction: used by the instructor to record and display feedback from the class e.g working out a formula. These include blackboard, whiteboard, flip chart, overhead projector and in some circumstances data projector/computer.

Demonstration: used to give students a real world feel for the object or process being demonstrated. When discussing equipment the best aid to use is the equipment itself. There is no better way to teach a trainee the markings on a cylinder, then to actually show them a cylinder and identify, explain the individual markings. Models, resuscitation dummies, If you are using several equipment aids, keep them out of sight as they will become a source of distraction.

Each visual aid has its part to play, in some instances you will use a combination of types of aid. It is important that the visual aid you choose best suits the lecture to be given.

Data Projectors

Modern Data Projectors are lightweight, compact, easily transportable and have a very good brightness/contrast ratio.

How does it Work?

The light from a high power lamp is split into three paths which pass through red, green and blue filters. Each of these beams then pass through a Liquid Crystal (LCD) panel which displays the red, green or blue component of the signal being received from an external computer or video source. The resultant light beams are then recombined before passing through a series of lenses which control focus and zoom. The individual LCD panels are small and can contain nearly one million pixels each, therefore the alignment of these panels has to be extremely precise. This means that projection systems should never be handled roughly otherwise misalignment may occur.

Features

Most modern data projectors are designed as full featured multimedia presentation systems and therefore combine many or all of the following features in addition to mirroring a computer display.

Brightness and Contrast: Low illumination data projectors are unsuitable for use during daylight hours except in a blacked out room. A decent contrast ratio is required to present a crisp looking image.

Resolution: The resolution of projectors is constantly improving. A good average resolution nowadays is 1024 x 768 pixels (XGA). Computers with older video cards of a lesser resolution will work with modern projectors but the image may be a little fuzzy.

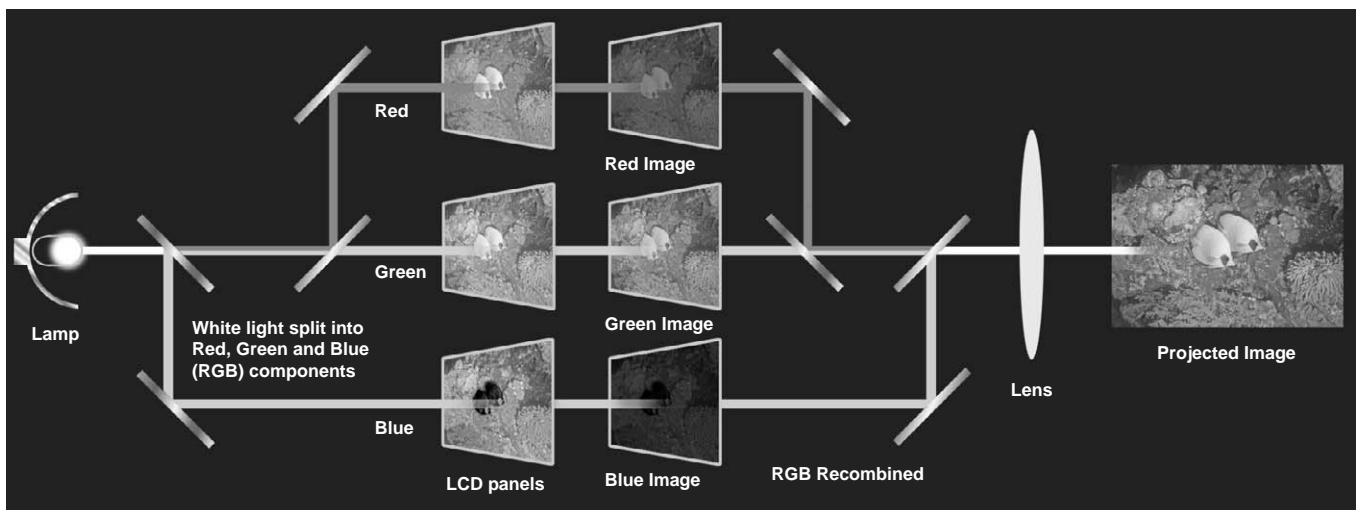
Video input: Moving images from video recorders, DVD players and camcorders can be displayed via component or S-video connections.

Audio: Internal speakers are built into many projectors for audio playback. These speakers tend to be small and may not suit larger audiences, larger external powered speakers may be required.

Keystoning: Some systems have an inbuilt keystone correction facility in order to produce a perfectly squared image. (Demonstrate by adjusting projector or tilting screen).

Lens: The focal length and zoom range are critical issues when selecting a projector. A wide angle lens requires the projector to be placed near the screen whereas a long lens needs to be placed a distance away in order to fill the screen. Portable projectors tend to come with short connection leads. If the projector is to be used in a number of locations a wide zoom range should cover most venues.

Ceiling mounting: Classrooms may benefit from having a data projector permanently fixed to a ceiling support. In this instance the projector is mounted upside down and the image is "flipped" to project correctly on screen.



Remote control: Many projection systems include an infra-red remote control to operate power, standby, volume and input source. One very useful feature on some projector remotes is a presentation control which allows the user to advance slides and operate the computer remotely by use of a USB link from the computer to the projector. Some manufacturers provide a laser pointer built into the remote. A recent introduction to the market is the wireless presentation remote. This uses a radio link to control the presentation on the computer via a small receiver which plugs into the USB port. These devices have the advantage of not requiring the operator to point directly at the projector for each slide change.

Using a Data Projector

Become familiar with the model you are using and follow the manufacturer's instructions. The start of the lecture is not the best time to learn or troubleshoot the system.

Position the laptop where you can easily see the display and reach the keys without stepping in front of the projection beam.

Ensure that all cables are connected correctly.

Turn on the projector before the computer in order to allow the computer to recognise the device to which it is connected.

During the Lecture

Become familiar with which keys on the laptop will advance or reverse the presentation slides, this will help you keep your lecture running smoothly.

Presentations may need to be paused for a few minutes to allow for demonstrations, questions etc. To prevent the slide on screen from becoming a distraction it can be useful to include completely black slides at appropriate points. This will have the same effect as turning off the projector without the wait incurred for it to warm up again if it was actually switched off. Beware these pauses should not last longer than a few minutes as the LCD panels do wear from long exposure to high intensity light. When the pause is longer than 10 minutes or during a break it is advisable to turn off the projector or put it into standby mode if this mode means the lamp turns off.

After the lecture

Due to the high intensity of the lamp many projectors become very hot. Some models even require a cool down period where the fan keeps running after the lamp turns off. Do not place the projector back into its carrying case until it has cooled down, as some lining materials within the case could melt.

When packing away the projector make sure that all cables, remotes, lens caps etc. are stored away correctly. A common problem occurs when one user packs the monitor connection lead into their laptop case leaving the projector unusable for the next operator.

Overhead Projectors

There are two types of overhead projector on the market. One is a transmitted light model, which is box shaped with the lamp shining upward through the transparency to the lens, the other being a portable model where the lamp is housed alongside the lens and shines down through the transparency to a mirror which reflects the light back to the lens.



Transmitted Light Model

Reflected Light Model

Using Overhead Projectors

Position transparency squarely on the projector.

Ensure correct focus.

Correct for keystoneing by moving top of screen forward.

Looking at the transparency on the projector rather than the projected image prevents you from turning your back to the class.

Place a sheet of thin paper over the acetate before placing on the projector. The instructor should be able to read the acetate through the paper without the class seeing it on screen. Move the paper down the transparency point by point as they are being discussed (revelation technique).

When writing down feedback from the class or working out a formula use a "write-on transparency" sheet and non permanent markers. This is as effective as using a white board or blackboard.

Placing a "write on" transparency over a colour one of dive tables will allow the instructor to highlight sections of the tables without marring the original.

When discussing points not covered by the transparency cover it with a sheet of paper or switch off the projector

Types of transparency film

Laser/copier film: used for printing out on a laser printer or in a copier to reproduce an original from paper. These films have a high heat tolerance as the toner

is bonded to the film by passing it through hot rollers. Do not use this film in an inkjet printer as the water soluble ink will not stick to the smooth surface.

Inkjet film: designed with a layer of gelatin like coating on one side to hold and bind water soluble inks. This film is not heat tolerant and may melt if inserted into a laser printer or photocopier, possibly causing severe damage to the machine. This is an expensive film and considering the cost of printer inks

care should be taken in the design of overheads to reduce or eliminate background colours which will rapidly consume ink cartridges.

“Write-on” film: as the name suggests this film is designed for hand drawing or writing directly on the transparency. Do not use for main lecture slides as a handwritten overhead looks amateurish unless you are a skilled calligrapher. Best used for feedback notes or overlay marking.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

In-water Instruction Techniques

This lecture will cover the brief to a group of students, either on the bank of the pool or sheltered water. We will also cover management of the pool, organisation and safety of the group.

Introduction

Teaching in an in-water environment requires planning for extra considerations and safety measures. The basic teaching techniques remain the same, but now, as an Instructor, you have the opportunity to emphasise the learning through 'doing'. On the pool bank there may be a number of groups being led by Instructors, together with the noise and activity in a pool area this all provides distractions for an Instructor. It is imperative the Instructor is able to deal with all scenarios within this environment. The Instructor is responsible for the well being of the group of students and as well as for the teaching. The Instructor will be the first person to be consulted in an emergency situation.

Brief – for poolside/sheltered water

The Instructor gathers the students for the brief in a quiet area on the pool bank – or sheltered area away from activity if outside. Make sure the students are not facing anything that may cause a distraction to them. The Instructor should be careful not to be looking over the students' shoulders too!

Introduce yourself, Club, grade and ask for the names of the group. If you have an assistant introduce them also. You should ask if everyone is OK.

State the exercises to be done. Give clear reasons for the purpose of each exercise and its relevance to diving. Draw on the student's experiences from previous skills that have already been learnt.

Give step-by-step instructions as to how to perform each skill incorporating specific signals and safety issues for the exercise. Use either an assistant or a student to help demonstrate if necessary.

State general safety requirements: use of hand signals, poolside behaviour, care of equipment – both equipment being worn and left on pool bank. Emphasise that you as the Instructor will get in water first and exit last.

Indicate the order in which the students will do the exercise, and tell them to watch each other whilst waiting for their turn, but to ensure they are safe i.e. holding on to the side of the pool.

Ask for questions, these may often be better answered by demonstration.

The brief is just that, brief – no longer than 2-3 minutes.

For snorkel exercises:

Instructor to enter the water first, students to assemble in one area in the water.

Instructor demonstrates the exercise

Each student should then be invited to attempt the skill. Instructor should give feedback to each student after their attempt, correcting mistakes and complimenting achievements. Once every student has attempted the skill the Instructor has an idea of what needs working on. You should continue with the exercise until the allotted time is up.

If the students have all achieved the exercise, introduce an extra element e.g. ditch and recovery of mask and fins – once fitted underwater swim extra 10m before surfacing.

For scuba exercises:

Scuba equipment should be assembled with the students and checked by Instructor. The equipment should be left ready on the bank, together with weights if needed.

Enter the water in the shallow end, Instructor first, then students.

Instructor must kit up first, with the students observing. This helps them to get familiar with the gear.

Instructor should then help each student in turn, checking the equipment once on and turning air on.

If possible the Instructor should run through the procedure (e.g. buddy breathing) in the shallow end, with the required signals. The group moves to a suitable location for exercise where the Instructor should demonstrate the full exercise.

Each student will then attempt the exercise in turn. The Instructor should correct where possible, and note any verbal feedback required, using a slate if necessary. Don't forget to praise as well.

At the end of the time the Instructor moves group to safe exit point, removes kit, assists students out of the pool. Instructor must exit water last.

If the equipment is no longer required the Instructor should disassemble it with the students and safely stow. The students should be gathered for the debrief.

Debrief

Bring the students together in a similar place as for the brief. Check all of the group are OK. Debrief by summarising the session briefly, give praise where due and encourage each student to work on weak areas. If there were any incidents briefly sum up the occurrence, what happened and how this could be prevented.

Ask for questions or feedback from students – answer if possible, ensure to get back to student if you cannot respond at the time. End of session – encourage the students to return next time/week/session.

Report all incidents to Shore/Pool Marshall.

General

Each pool exercise has step-by-step instructions as to how it should be carried out. Use these guidelines until you are familiar with teaching the method. You will find it easier to correct mistakes and assess the performance of the students once you are familiar with the methods.

Pool Management

The management of the pool is imperative to ensure maximum use of both the pool and the time. Firstly the exercises to be carried out should be decided. Often available equipment, skills already achieved and those still to be completed by students, availability of Instructors and group sizes will dictate the exercises to be done. Also you will need to consider other club members attending the pool sessions and not involved in training. A separate section roped off is a good idea to avoid anyone getting hurt.

It is necessary to make sure that each group know which section of the pool is to be used.

To give a balance to pool sessions it is best to try to incorporate both snorkelling and scuba exercises. However at the start of a training programme it may be necessary to concentrate on snorkelling skills before introducing scuba. This should be decided in conjunction with the Club's Training Officer.

To maximise the use of space in the pool the exercises can be divided into Shallow end and Deep end exercises. There are some exercises that can only be carried out in the deep end for safety reasons.

Exercises for Deep end only

Surface dives

Rolls

Entries

Ditch and recovery – snorkel and scuba

All other exercises are conducted either on the surface or may be performed safely in the shallow end. Some exercises are easier to perform in the deep end, e.g. buddy breathing, mask clearing, and use of buoyancy

device. But if the deep end is already fully utilised, you will need to be imaginative in the use of the shallow end. Buddy breathing can be achieved by lying on the pool bottom in the shallow end!

Once you have decided the specific exercises to be done, you can plan where they need to be, i.e. deep end, shallow end, or on the surface/underwater using the whole length of the pool.

Pool layout

The easiest method of dividing a pool is to use lane markers giving a number of straight lanes, but a diagonal section can be achieved as well. The area to be used can be further sub-divided, usually with imaginary boundaries by instructing each group to stay within a certain space.

Group Organisation

Once the pool plan is set you need to organise Instructors for each of the exercises. Instructors often have exercises they prefer to do, so it is courtesy to ask. You should aim for a ratio of no more than 6 trainees to 2 Instructors. This also ensures that everyone gets to know each other, and the Instructor is likely to be able to give more accurate feedback.

You need to organise any equipment necessary for the chosen exercises, remembering to provide for Instructors and trainees plus a spare set in case of malfunction.

The students should be divided into groups according to which exercises they need to achieve. At the start of a training programme this is easier as all the students start from the same level, but as the sessions continue the students will progress at different rates. It is imperative to keep accurate records to ensure students are not endlessly repeating the same exercise and becoming bored and disillusioned.

Once the groups are planned you need to organise the rotation throughout the pool session. This is often best achieved by leaving the Instructor 'in place' and moving each group of students onto the next exercise. The students experience a selection of exercises and Instructors (although the Instructor is left with the same exercise throughout). However this does enable the Instructor to get an overall view of the performance of the students as a whole. This highlights the importance of asking Instructors for their preferred exercise.

Safety

Safety is an important aspect of any pool session. You should make sure that lifeguards are on duty and appoint a Pool Marshall – someone who has full details of the groups, exercises with Instructors and can watch for activities that may be dangerous. The Pool Marshall will ensure the smooth running of the pool session as he or she will know who should be where, with which Instructor and when.

Always keep well back from the edge of the pool during briefs and debriefs. Whilst in the pool use the corners, keeping the students against the edges of the pool and positioning yourself in the centre. Only allow one student at a time to attempt the exercise, until they gain more confidence.

Insist on any equipment being kept tidy on the pool bank and encourage all pool users to look out for possible hazards.

The pool safety notice must be adhered to at all times.

The location of first aid, the emergency plan and oxygen should be clearly marked and known to the Pool Marshall. Be aware of who can and cannot receive oxygen.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

Instructor Responsibilities

We will begin by considering what it means to be a Moniteur 1* Instructor (Mon*) and look at the outcomes of becoming an Instructor. The lecture will cover the roles and duties that come under the responsibilities of the instructor, with a brief look at what may be ahead. We will also look at an instructor's duty of care, with guidance on certifying divers and identify the two Codes of Conduct, one for divers and one for children within our sport.

Introduction

The M1* Instructor is the first step for all future teaching within the Irish Underwater Council. An Instructor becomes a role model that new divers will emulate. A new intake of trainees will not be aware whether this Instructor has been qualified for years or just last week! The responsibility and influence of an Instructor can be far reaching, and a newly qualified Instructor needs to be aware of this.

What is an Instructor?

An Instructor is a person who teaches and gives information and may direct and authorise activities. In the CFT context the instructor must be able to impart knowledge and teach practical skills to varied groups of students. An Instructor will respond to any student to overcome barriers of learning difficulties or cultural differences that may exist. The Instructor also has the ability to lead and motivate students, and is able to function within the organisation and club structure.

The outcomes of becoming an Instructor

- The Instructor will train divers and snorkellers to be competent and safe.
- The Moniteur 1* Instructor may direct and certify a Diver * course
- The Moniteur 1* may instruct all modules under the guidance of a Moniteur 2** up to and including Leading Diver grade.
- A Moniteur 1* may organise certain courses at regional level.

Responsibilities

The Instructor is responsible for the outcome of any decisions made by them, and is accountable for their actions.

We will look at the responsibilities of the Instructor under two headings:

1. Role of the Instructor
2. Duties of the Instructor

1. Role

The role or function of the M1* is to teach and in some instances to certify. The methodology of teaching is described in the Principles of Teaching lecture. An M1* can organise a Diver * training course and certify divers to that grade. Guidelines for examining grades above D* are given in the Jurors course.

The Diver* course is the basic diver training course in CFT that students take, and therefore the Instructor will often become a role model. It is not uncommon for an instructor's particular area of interest to be influential in the outlook of the students. In fact much of his or her enthusiasm and energy for diving and training may stem from this interest.

The M1* has an important role to play as a jury member on completion of the Juror's course. This can be two fold, firstly the M1* is acting as a trainee examiner learning the examining criteria, and secondly the M1* is closer to the plight of the candidates than a long standing M2**, possibly with a greater degree of empathy. The M1* is often closer to candidates than an M2** or M3*** and may well have a better knowledge of the club or training environment.

2. Duty

The duties of the Instructor are wide:

Respect

Instructors must respect their students and provide them with an environment where they can part-take in the sport of diving and its associated activities in a safe way. Instructors should encourage an environment where all divers feel able to improve their diving skills and personal development.

The Instructors should be aware of any student with a learning difficulty such as dyslexia, for example, and make adequate provision for this person's participation where possible. Cultural differences should be embraced and respected. Where language or communications difficulties arise these should be handled sympathetically and ensure safe and effective training.

Standard of teaching

The Instructor has a duty to maintain a high standard of teaching and instruction to ensure that students have the correct and adequate information in order to carry out the tasks required of them competently and safely

Standard of grade

It is also the duty of the Instructor to maintain the standard of the grades being taught. Each grade requires the achievement of a certain level of theoretical knowledge and practical skills and this standard must be maintained for each grade otherwise it will be devalued.

Source of information

The Instructor should be a source of knowledge and know where to find additional information when needed. This does not mean every Instructor needs to be a walking diving encyclopaedia, but an Instructor must have a broad base of diving knowledge including developing techniques, practices and theories. Of course, he must have an in-depth knowledge of CFT training materials and its background material.

Up-to-date information

An Instructor should ensure that their knowledge and teachings are up to date. It is the Instructor's responsibility to make sure the module being used is the most recent and the applied guidelines from Course and Tests Booklet are the most up-to-date. It is also wise for an Instructor to keep up-to-date with the developments and advancements within the diving industry, especially with equipment and current practices, e.g. CPR. There is often new thinking published for some of the more theoretical aspects of diving, e.g. decompression. Bear in mind however that it is vital to provide the CFT approved materials and techniques that comprise the 'Modules'. While it is desirable to provide information of alternative theories etc. to advanced students, great care must be taken to ensure that trainee divers gain a clear and uncomplicated understanding of the material and techniques they must know to dive safely and pass their tests.

Role Model

The Instructor as a role model needs to ensure that their dive practices are beyond reproach. All skills taught should be performed with ease, and all teaching should be carried out with confidence. Students will often imitate an Instructor, especially if the Instructor is viewed with high respect, therefore any bad practices will be copied. It is natural for the inexperienced to look towards the more experienced people for guidance.

Instructor log

The Instructor should keep a log of all instruction given. This is part of an Instructor's duty of care. They are obliged to teach to a certain standard, the Instructor log

is a record that the student received the information. It is now a requirement for some courses that each student signs to say the teaching has been given and they fully understand the content. But it is the duty of the Instructor to ensure the instruction is to the necessary standard and is taught in an effective manner.

Moniteur 1* - what happens now?

Jury

With further training the M1* can act as a trainee examiner on a jury where a candidate's ability is assessed. This assessment must be done in a 'professional' manner, affording the candidate the opportunity to be examined fairly and succeed. An M1* must attend a Juror's course in order to become a trainee examiner.

Course organiser

The M1* will often be requested to assist in the organisation of a course. This will entail organising the location, the equipment required (both for presenting and demonstration), the teaching programme, liaising with RDO's, DO's and other club members and passing on all the necessary information to those attending the course, both students and instructors

The course organiser will often have an input into which Instructors will teach on the course. As we have seen the role and duties of an Instructor are wide and varied, but often Instructors have particular topics they are good at, or have a particular interest in. It is the responsibility of the course organiser to make sure the Instructors used are the best for the subjects. As new Instructors it can be difficult to assess or even know many Instructors. The networks within CFT, at club, regional and national levels can be utilised to lean on the experiences of other Instructors for help.

Duty of Care

A duty of care begins the moment an Instructor steps in front of a class or stands at the side of a pool or shore line in order to instruct, teach, impart knowledge, examine or certify students. It is the Instructors' duty to perform this task to the highest possible standard, as set out by the training agency – the Irish Underwater Council. The Instructor also has a duty to ensure a certificate for a grade is only awarded if it is deserved, i.e. the level of skill and knowledge required for the grade are met.

In the water the Instructor must observe the recommended requirements as laid down by CFT for Instructors. The equipment provided must meet the needs of the students, the student to Instructor ratio must not be exceeded and the conditions must be suitable for the intended teaching to take place.

The Instructor is bound to teach students in a safe and thorough manner and to ensure that the tasks required of them are within reasonable expectations.

Certification of D*

The M1* is able to certify trainee divers (D*). The requirements for this grade are clearly set out in the Courses and Tests Booklet. The Instructor has a duty to ensure the student performs these skills comfortably, safely and with confidence before sanctioning the grade.

If there are any problems regarding the function of the candidate on the test the Instructor can make some allowances, depending on the issue. It is wise to seek guidance in such cases from experienced examiners.

For candidates with a learning difficulty a theory test may be conducted orally or extra time may be allowed. The Examiner may also take steps to ensure a candidate's understanding of the questions.

Where the difficulty is one of language, again the candidate may be allowed extra time again ensuring an understanding of the questions asked if necessary.

For candidates with a physical disability advice should be sought from the NDO with regard to allowances to be made. This is to ensure the qualification awarded meets the standard requirements.

Codes of Conduct

There are two codes of conduct you must be aware of as Instructors. One code we must abide by every time we go out diving – Code of Conduct for Divers. The second code is relevant to Instructors who are involved in the teaching of children – Code of Conduct for Children's Underwater Sports.

Code of Conduct for Divers

This is very straightforward, and is freely available to everyone, either in the form of a label suitable for insertion in the Logbook, or on the website. This code has been written with our underwater heritage and preservation of the marine environment in mind. It is also important to realise that an M1* within the Irish Underwater Council is perfectly placed to influence future divers in order to uphold the ethos of the code.

Code of Conduct for Children's Underwater Sports

The Code of conduct for Children's Underwater Sports has been developed with the advent of young people taking up our sport. All persons aged under 18 are subject to this code of conduct, as are all adults working with children, the children themselves and the parents of the children. The code is designed to give all these people guidelines and policies in order that everyone is safeguarded. The emphasis is placed on the promotion of underwater sports within the spirit of fair play.



Instructor* (C.M.A.S. Moniteur *)

STUDENT HANDOUT

Using PowerPoint

Introduction

This lecture is intended to give the instructor an introduction to using PowerPoint for the preparation of lecture visuals. It is not intended as an alternative to reading the manuals which accompany the software as features can change from version to version.

What is PowerPoint?

PowerPoint is basically a presentation package designed to deliver text, graphics, animation and video. It can be used to create overhead transparencies, 35mm slides and on-screen presentations. Additional features include the ability to produce and print lecturer's notes and student handouts. The core concept behind PowerPoint is the creation of standardised visuals by means of "Master Slides" on which common elements such as backgrounds, logos and type styles are set. The master will be automatically applied to all slides within the presentation. The program allows the user to deviate from the master when needed e.g. when a graphic clashes with the background colour of the master.

Preparing your presentation

Before using PowerPoint you should have your talk already planned and timed. Sketch out on paper the sequence of slides required to compliment your presentation. A good rule of thumb is to reduce paragraphs to sentences, sentences to phrases and phrases to key words. In general the only time a long sentence or a paragraph should be used is when presenting a quotation. Graphic images and photographs are very effective for explaining a point quickly and they also improve audience retention of the information provided. However the use of imagery must be relevant and keep in mind that images greatly increase the size of the PowerPoint file. After creating the presentation it can be easily refined at any stage.

Setting up your presentation in PowerPoint

At startup PowerPoint will present the user with a number of options. Select blank presentation. Next you will be presented with a choice of layouts, normally the first type to select is the title slide which provides text boxes for the title of the talk and the name of the speaker. Click this template but do not enter any text just yet. Go to page setup under the file menu and within the "slides sized for" popup menu make your choice from overhead,

35mm slide or on-screen presentation. The width and height will automatically change with the selection. Click OK to return to main screen.

Preparing the Slide Master

Go to the view menu and select Master/Slide Master. All elements created or altered here will apply to all slides. The first step is to create a background by going to the Format menu and selecting background. In the window which appears click the white popup menu which will give a choice of a range of colours, more colours or fill effects. Colours and more colours allows the user to select a solid background colour whereas fill effects gives a choice of gradients, patterns and textures. Choose an appropriate colour or fill effect and click apply to all. The background of the slide master will now update to the selected style.

Select all the text in the upper title box and under the format menu select font. This dialog box is used to set the typeface, size and colour of the title text. Choose a colour and style which works i.e compliments or contrasts with the background colour. When using bright coloured text on a dark background it is worthwhile applying shadow to the text in order to give it a "lift".

Repeat as above for the body text in the lower box. On the slide master this box shows bullet points in decreasing size order. This refers to first, second, third etc. levels. What this means is that the first level is the size and style applied to all main bullet points. Second level is a subsidiary level of the first level point above it and third level is subsidiary to the second level etc.

To add a logo or graphic to the master you can either copy it in from another application or import it by going to the insert menu and selecting picture/from file.

Return to normal slide view by going to the view menu and selecting slide.

Creating Slides

On the title slide click in the title box and type the name of your presentation. Click in the sub-title box and enter names and affiliations to complete the title slide. To create additional slides go to the insert menu and select new slide. From the choices presented select an appropriate template, normally the second from the left which is title plus bullet points. On these slides just enter a slide title and your bullet points in sequence. Hit the

return key to create new bullet points. To create second level bullet points just enter them as normal first level points, when all points are entered select the lines you want to convert to second level and click the demote button. Insert any images in the same manner as for the master slide.

Animating Text

Bullet points can be animated using a variety of effects. The aim of animating bullet points is to introduce each point as it is referred to in the talk. Previous points can be dimmed in order to keep the emphasis on the point being discussed.

To set animation for the whole presentation go to the slide master, for an individual slide work from the normal slide view.

To create the animation go to the slide show menu and select custom animation. In this window select an animation style from the effects/entry animation and sound popup menu. Leave the introduce text popup menu set to all at once. The grouped by popup allows the user to select whether second, third etc. level bullet points will be animated with the higher level points or separately. Click preview to see the effect in action. Do not use sounds as they are a distraction and should only be used for a specific purpose.

Animating Slide Transitions

When changing from one slide to the next the transition can be animated. Choose slide transition from the slide show menu and select an effect from the popup menu. Transitions can sometimes be distracting so use with care, or not at all. Always be consistent with transitions, the temptation to use every effect available can cause the presentation to appear very amateur

Saving your Presentation

Save the presentation as per any normal application file. If using a Macintosh end the file name with the extension .ppt in order to run the presentation on a Windows PC. The save as PowerPoint show option allows the presentation to run on any computer that has the free PowerPoint viewer installed, this means that the PowerPoint application itself need not be installed.

Editing your Presentation

The running order of the slides can be altered in the slide sorter view. Click on the thumbnail of the slide you want to move and drag it to the required position. Clicking on a slide and hitting the back delete key will delete the slide from the presentation.

Running the Presentation

Click on the slide show button to start the presentation. This will fill the entire screen with the slide. To advance to the next slide just click the mouse, spacebar or down arrow. To go back click on the up arrow. At the end of the presentation the program will revert to a normal view. To exit from the presentation at any time click the esc key. The slide show will run from the slide currently selected so make sure to start from the first slide when giving a talk.

Creating Overhead Transparencies

When designing overhead transparencies in PowerPoint keep in mind the expense of printing, especially on an inkjet printer. Using a dark coloured background will consume vast amounts of ink or toner. Use a dark text and/or images on a white or light coloured background.

In page setup select A4 paper as your slide size. Keep your design centered and away from the outer margins as some printers will not print to the edge.

Use the correct transparency film for output. Inkjet films have a gelatine like coating to absorb the ink and are more expensive than the laser compatible films.

N.B. never use an inkjet film in a laser printer or photocopier as the film will melt onto the heated rollers and possibly destroy the device. Using laser films on an inkjet results in the ink droplets sitting on the surface of the film where they will not dry or set properly.

Using Images

Pictures used in a presentation for output to 35mm slide need to be as high a quality as possible. These images should be scanned at high resolution and saved as compressed tiff files before importing into PowerPoint. The opposite holds true for images used for overhead transparencies and on-screen presentations. Images here should be no greater than 800 pixels wide and 600 pixels tall and saved as low to medium quality JPEG images. The GIF file format is useful for diagrams or pictures with less than 256 colours. The newer PNG format allows the user to import images into PowerPoint with a transparent background. Images taken from the web normally work fine for on-screen presentations.

The reasoning behind these choices is that 35mm slides give the highest definition projected image and therefore require high definition images to get the best output. Overhead transparencies are normally printed at a low definition on inkjet printers as overhead projectors cannot project at a high definition. The data projectors used for most PowerPoint presentations tend to project images with a resolution of between 800 x 600 pixels and 1280 x 960 pixels. Using high definition files here only increases the file size of the presentation and may cause the computer to run the presentation very slowly.

Drawing in PowerPoint

At the bottom of the PowerPoint screen are a set of drawing tools that include boxes, circles and a collection of shapes. Also here are a set of tools which allow the user to specify fill colours, line colour and thickness, line style, arrows and supplementary text boxes. At the left hand side is a popup menu called draw which gives the user the ability to manipulate drawn objects by rotating, flipping, aligning, distributing, grouping and ordering them. If the drawing tools are not visible in the window they can be called up from the view menu and selecting toolbars/drawing.

Creating your own Background Image

An imported image can be used as a background providing it does not clash with the text or objects in the presentation. Import the image in slide master view and under the draw menu select order/send to back. This will place the image behind the text. When printing black and white versions it is advisable to temporarily remove the background image.

Advanced Features

This lecture covers the basics of PowerPoint but there are many advanced features to the package.

Video: PowerPoint can import and play Quicktime video clips from within the presentation. This feature should only be used for illustration purposes as there are better dedicated video playing packages available for large video files.

Web Links: PowerPoint can automatically launch a website when the computer is connected to the internet.

Applications: PowerPoint can launch any other application from a link within the presentation to illustrate a point e.g. launching the Adobe Acrobat application to view PDF documents.

Hyperlinks: Buttons, text links and invisible links can be created within a presentation which can allow the user to hop to a different point within the presentation and back again. This is especially useful when regularly referring back to an image file as it needs to be imported only once. Other PowerPoint presentations can be accessed by links or buttons. A good example of this is to create an index presentation linking to all your existing presentations. This means that only the index file needs to be found and opened.

Animated Charts: Graphs and charts can be created within PowerPoint and animated to build in sequence.

Timing: The timing of a presentation can be rehearsed and set within the application.

Narration: With the use of a microphone a narration can be recorded that will play in conjunction with an automatically running presentation.

Finally

An artist will not use every colour in their paintbox to paint a seascape. The same holds true for PowerPoint. Don't overuse the vast array of transitions and effects available to you. Keep it clear and simple.



Diving Physiology

Ears & Sinuses

The Ear

Students should be able to sketch a diagram of the ear and label its parts.

The ear can be considered in three parts: outer, middle and inner ear.

The outer ear consists simply of the pinna and the auditory canal. The function of these components is to gather sound waves and channel them towards the middle ear.

The outer and middle are separated by the eardrum: a semi-flexible, non-porous membrane also known as the tympanic membrane. The middle ear is of most interest to divers because it is a gas-filled space and therefore is affected by changes in the ambient pressure.

Within the middle ear there are the three bones: the hammer, anvil and stirrup collectively known as the ossicles. The ossicles convert sound waves (i.e. pressure waves) into mechanical vibrations and transmit them to the cochlea.

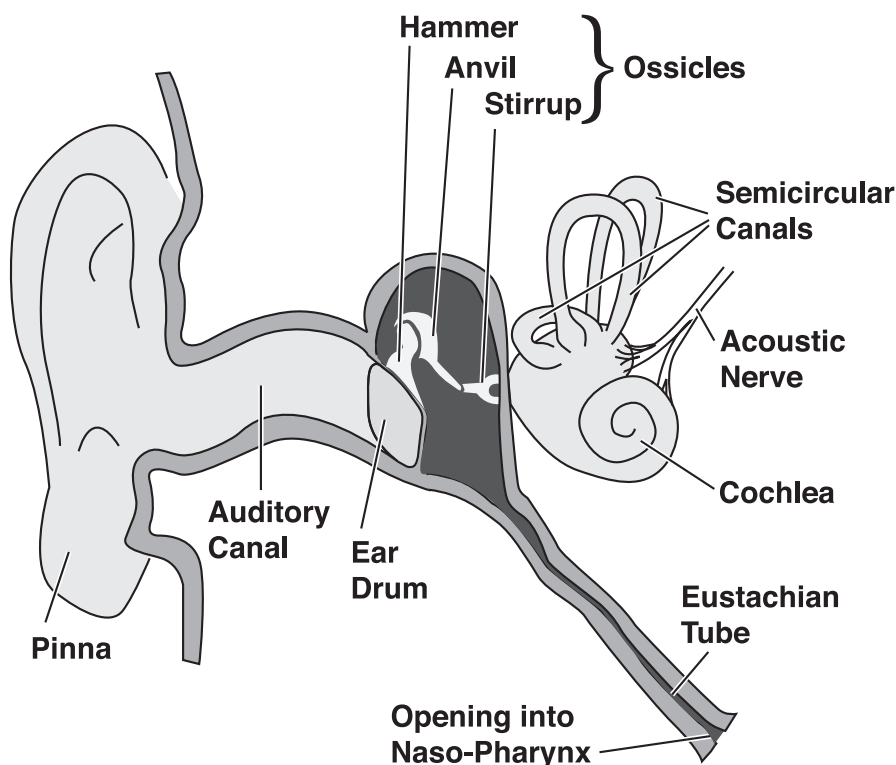
The lower part of the middle ear contains the eustachian tube which is the opening to the naso-pharynx (the back of the throat) and ultimately to the lungs. This tube is of critical interest to divers. As divers descend the ambient pressure on the outside of the eardrum is increasing relative to the pressure on the inside. If the diver did not

have a means of equalising the pressure on both sides then the eardrum would eventually burst. Forcing the Eustachian tube to open e.g. the valsalva manoeuvre will allow ambient air (breathed from the regulator) to move from the lungs via the naso-pharynx and enter the middle ear. This is the process known to divers as "equalising."

The inner ear contains the cochlea and the acoustic nerve. The cochlea essentially converts mechanical vibrations (which are of analogue form) to digital form for transmission to the brain via the acoustic nerve.

More relevant to divers are the semicircular canals also found in the inner ear. The whole of the inner ear contains fluid (not gas). The semicircular canals are covered in follicles (tiny hairs) which can become covered or uncovered in the fluid. This system is referred to as the vestibular system or balance system. As we move (or are moved), the attitude of our head (and therefore the inner ear) changes resulting in movement of the fluid. The displacement of the follicles by the fluid is transmitted to the brain which determines the new attitude.

If the diver was to suffer a burst eardrum, the resultant cooling of the fluid can give rise to false attitude messages being transmitted. The diver may then suffer from vertigo i.e. when the message from the vestibular system and visual system do not agree.



Reverse ear drum blockage can occur on the ascent if the diver is no longer able to equalise the relatively high ambient pressure in the middle ear with the lower (reducing) ambient pressure in the outer ear. The eardrum may then burst outwards. This could potentially occur if the diver were to take decongestants prior to the dive thus clearing the Eustachian tube. If the effect of the decongestants was to wear off during the duration of the dive and the Eustachian tube was to become blocked again reverse eardrum burst could occur.

The sinuses, like the lungs and the middle ear, are of interest to divers because they are a gas filled space. The purpose of the sinuses is to make the head lighter and to give the voice resonance. To avoid pain or injury gas should be freely able to move in and out of the sinuses. If, for example due to a cold or sinus infection, gas was to become trapped in the sinuses the diver could suffer extreme pain or even suffer injury.

Respiration

Respiration specifically refers to the inhale, exhale and pause cycle that we know as breathing.

The inhale phase of the cycle is triggered by the medulla (a gland) in the brain. The medulla is constantly tracking the level of carbon dioxide (CO₂) in the arterial blood and when it reaches a given threshold it triggers a respiration cycle beginning with an inspiration. It is very important to note that breathing is triggered by elevated levels of CO₂. It is a common error to assume that lower levels of oxygen cause the body to breath.

The medulla sends a signal which stimulates the diaphragm to tense thereby drawing it and the rib cage downwards. This movement of the diaphragm and the intercostal muscles (the muscles between the ribs) causes an effective vacuum which then "drags" air from outside down into the lungs.

Subsequent relaxation of the diaphragm increases the pressure in the lungs and forces the air out i.e. exhalation.

Shallow water blackout is a very dangerous phenomenon relevant to snorkel divers. If the snorkel diver engages in the dangerous practise of hyperventilation prior to a snorkel dive, the diver is ridding his body of more CO₂ than would normally occur during normal respiration. Thus, the level CO₂ of is artificially low after hyperventilation (This is known as hypocapnia). Given that elevated levels of CO₂ are the stimulus to breathe, the diver's urge to breathe is diminished. However, the divers need for O₂ is not diminished (indeed it will have increased due to exercise) but this need is not satisfied due to lack of respiration. Therefore the diver could potentially black out due to lack of O₂ while still immersed. This is why hyperventilation prior to snorkel diving is FORBIDDEN by CFT.

Metabolism refers to how the tissues combine food and O₂ to create energy to allow each tissue to perform its function.

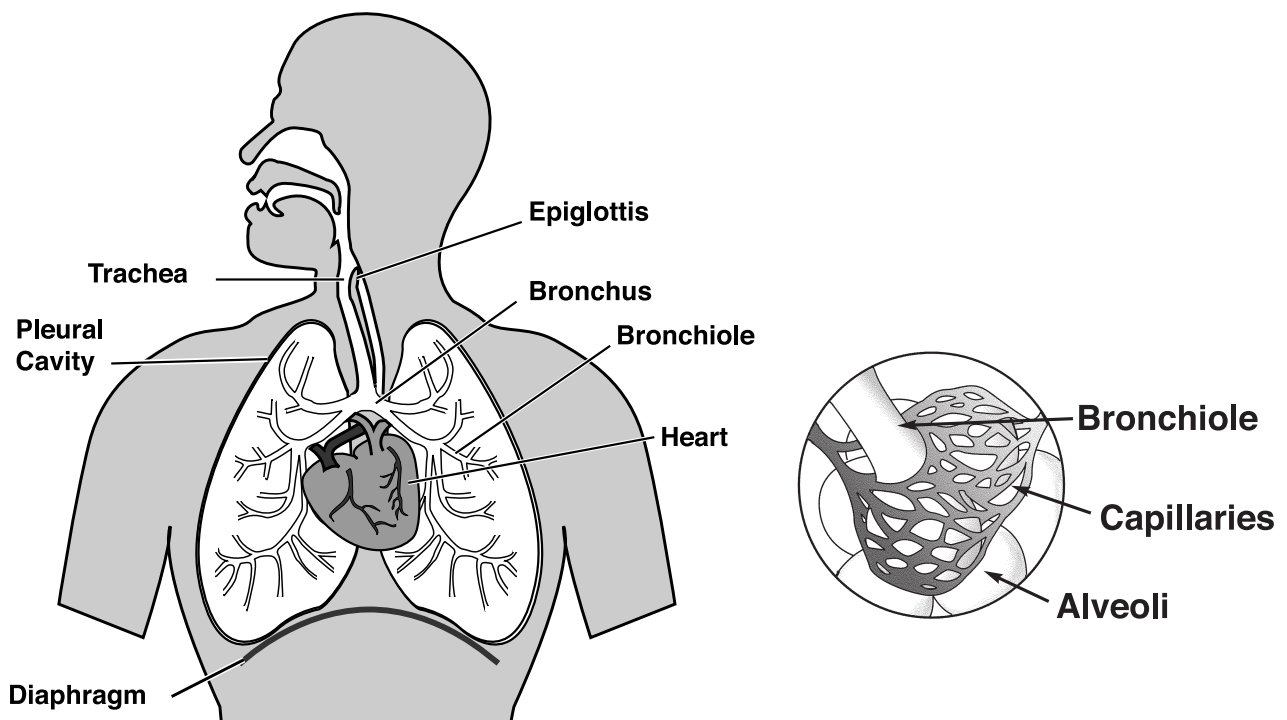
Airway and Lungs

Airway

Starting from the top of the airway at the naso-pharynx, the epiglottis controls which "tube" is open and which is closed i.e. when inhaling the oesophagus is closed and when swallowing food or a drink the trachea is closed.

From the trachea down, the airway is constantly branching out into smaller components. The trachea is the main airway passing from the back of the mouth (naso-pharynx) down through the throat.

At the bottom of the trachea, the airway branches into two bronchi (one bronchus, two bronchi), one going to



each side. They are further subdivided into a series of bronchioles.

The lung system is contained within the pleural cavity.

The diaphragm, at the bottom of the rib cage, together with the intercostal muscles, forms the mechanism for breathing as described above.

The heart is inside the mediastinum which lies between the lungs.

Lungs

It is not correct to liken the lung to a balloon filling and emptying. To do so is to greatly exaggerate the elasticity of the lung. A better analogy is a piece of broccoli. The main stalk could be considered to be the bronchus, further stalks the bronchioles and then at the top of the broccoli (the flower part) is the alveoli.

It is at the alveoli that the gas exchange takes place. The capillaries (carrying blood) pass close to the alveoli and a surfactant between the two facilitates gas exchange. The gas exchange takes place through a process of osmosis. It therefore depends on a pressure gradient existing. In this case the partial pressure of CO₂ (ppCO₂) in the blood is higher relative to the ppCO₂ in the gas in the alveoli. Therefore, CO₂ moves from the blood into the lungs.

The ppO₂ in the blood is lower relative to the ppO₂ in the lungs therefore O₂ moves from the lungs into the blood. This dual process happens concurrently. See the table below for partial pressures of the relevant gases at the different stages of respiration.

	Atmospheric Air	Expired Air
Nitrogen	78.5%	74.5%
Oxygen	20.92%	15.8%
Carbon Dioxide	.04%	3.55%
Water Vapour	.49%	6.2%

Note ppO₂ in expired air is .158. 16% is sufficient to sustain human life, a fact which means CPR (or *expired* air resuscitation) is useful. This fact is also relevant to trimix diving.

Lungs: Definitions

There are a number of definitions related to breathing and the lungs:

Total Volume: The total volume of the lung i.e. the volume of air in the lungs after maximum inspiration (6.5l)

Tidal Volume: The amount of air breathed in or out during normal respiration (.5l)

Vital Capacity: is the maximum volume of air that a person can exhale after maximum inhalation (up to 4.5litres)

Residual Volume: The amount of air left in the lungs after a maximal exhalation (1.5l).

The average human, at rest, breathes approximately 6 litres/minute.

Decompression Illness

Often, students confuse Decompression Illness (DCI) and Decompression Sickness (DCS). In order to clarify this, students can imagine a tree structure with DCI at the top. The term, DCI, refers to all types of illness which can occur as a result of decompression.

Decompression Sickness (DCS)	Burst Lung
Type I	Arterial Gas Embolism (AGE)
Type II	Pneumothorax
	Mediastinal Emphysema
	Subcutaneous Emphysema

The tree then splits in to two branches: DCS and Burst Lung.

The DCS *branch* further splits into Type I and Type II.

The burst lung branch further splits into Arterial Gas Embolism (AGE), Pneumothorax, Mediastinal Emphysema and Subcutaneous Emphysema.

Decompression Sickness

Type I DCS has symptoms such as rash, pain in the joints, itchiness etc. Type I DCS is not as serious as Type II except to the extent that it could be present prior to the onset of Type II.

Type II DCS or Central Nervous System (CNS) bend is very serious. Its symptoms include disorientation, paralysis, double vision etc.

50% of DCS symptoms will appear within 1 hour of surfacing while 90% will appear within 6 hours.

Burst Lung

Of the four types of burst lung, the AGE is by far the most serious. It occurs when a gas bubble(s) escapes through ruptured alveoli into the blood capillaries and on into the arterial system. It can then potentially block the oxygenated blood supply to the organs as the bubble expands. The CAGE (Cerebral AGE) is the most serious as the brain tissues can only survive approximately 3 minutes without oxygen.

Symptoms include a sharp (involuntary) shout on reaching the surface, frothy sputum, weakness, paralysis, staggering, cyanosis etc.

Pneumothorax occurs as a result of gas (normally air) leaking into the pleural cavity (which holds the lungs) through ruptured alveoli. Due to the pressure (increasing due to expanding gas) the victim may experience shortness of breath, chest pain aggravated by deep breathing and/or pain favouring one side of the chest.

The mediastinum contains among others the heart, major blood vessels, the oesophagus and the trachea. Mediastinal Emphysema occurs when escaping air travels *back* along the bronchioles, the bronchi the trachea and into the mediastinum. The increasing pressure of the expanding gas will interfere with the heart's pumping action and thereby restrict blood flow. Symptoms include chest pain, cyanosis, shortness of breath and a crunching sound in the mediastinum which may be heard above the heartbeat.

Subcutaneous Emphysema often accompanies mediastinal emphysema. Instead of gas travelling into the mediastinum it continues back up the trachea and starts to gather under the skin of the throat and neck. Symptoms include swelling/inflammation around the neck, changes in voice tone and localised crackling if the area is moved or touched.

Note that the latter three forms of burst lung all have similar symptoms but each one has at least one unique symptom. Students should be familiar with the symptoms of each and also the symptoms which distinguish one type from another.

Heart & Circulation

Blood

The blood is made up of four components, three of which are suspended in the fourth.

The red corpuscles hold the haemoglobin. This is very relevant to divers as this is the means of transport of O₂. O₂ combines with haemoglobin to make the compound: oxyhaemoglobin. This compound is then pumped around the body to the tissues. Critically, carbon monoxide (CO) combines with haemoglobin approximately 200 times faster than O₂ forming the compound carboxyhaemoglobin. Thus if the diver inhales CO, the amount of haemoglobin available to transport O₂ will be reduced. This is referred to as carbon monoxide poisoning and can be fatal.

The red corpuscles are the largest constituent part of the blood. Anaemia refers to a low red blood cell count. A person who is anaemic, therefore, has a reduced capacity to transport O₂ around the body.

White corpuscles are produced in the bone marrow and are the basis of the immune system.

Platelets are also produced in the bone marrow and are used by the body in clotting.

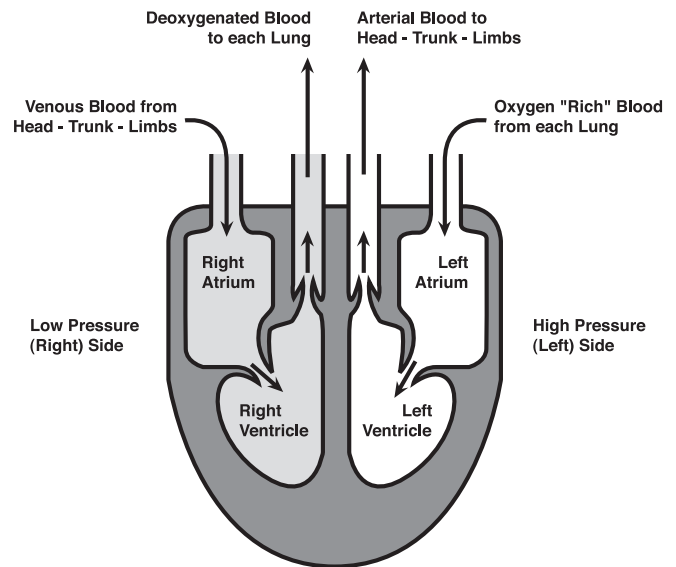
Plasma holds the red & white corpuscles and the platelets in suspension. CO₂ when dissolved in water becomes

carbonic acid. This carbonic acid is also suspended in plasma i.e. plasma is the means of transport of CO₂ waste.

The average human body contains 4-6l of blood.

The Heart

Students should be able to sketch a diagram of the heart and label its parts.



At its most basic, the heart could be considered to have four sections and four tubes.

An atrium is equivalent to the area in a building where people gather; similarly it is in either *atrium* of the heart that the blood gathers. In addition, students may think of the ventricles as pumps.

Remembering which side of the heart pumps to the lungs and which side to the rest of the body can then give the student a full mental picture of the four sections. The mnemonic, "the left side labours," is helpful i.e. the left side does most of the work pumping blood to the whole body. Obviously the tissues of the body need O₂ so it is oxygenated blood that is coming from the left side. As a result, the left side needs to operate at a higher pressure i.e. it is the high pressure side.

In summary, oxygenated blood (coming from the lungs) gathers in the left atrium, is transferred to the left ventricle and from there is pumped to the entire body. Deoxygenated blood (coming back from the body), gathers in the right atrium, is transferred to the right ventricle and from there is pumped to the lungs for oxygenation.

In general, oxygenated blood is transported by arteries away from the heart and deoxygenated blood is transported by veins back to the heart. There are two exceptions highlighted below.

On the right side/low pressure side, the vena cava carries deoxygenated blood into the upper right chamber of the

heart i.e. the right atrium. The pulmonary artery is the first of the exceptions mentioned above. This *artery* indeed carries blood *away* from the heart but it is *deoxygenated* blood going towards the lungs.

On the left side/high pressure side, the pulmonary vein carries oxygenated blood into the upper left chamber of the heart i.e. the right atrium. The pulmonary vein is the second of the two exceptions mentioned above. This *vein* indeed carries blood *into* the heart but it is *oxygenated* blood coming from the lungs. The aorta is the primary artery bringing arterial (oxygenated) blood away from the heart. Significant arteries include the carotid artery which brings blood to the brain and the coronary artery which brings blood into the heart muscle itself which, understandably, has a relatively high demand for blood/oxygen.

Circulation

The foregoing section on the heart is central to the circulatory system. There are a number of additional terms and points relevant to circulation.

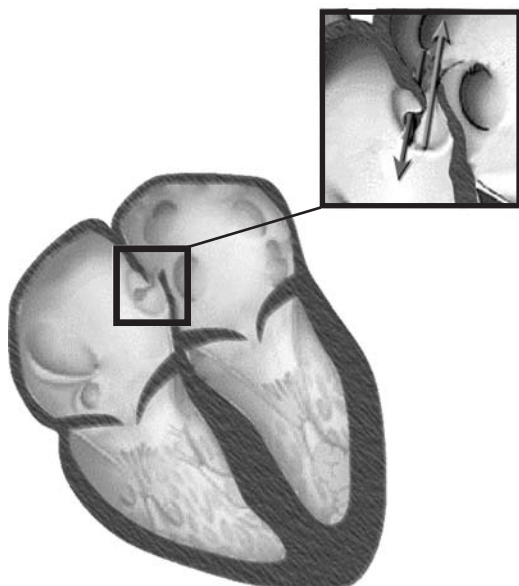
The systemic circuit refers to the circulation of blood around the entire body i.e. the entire *system*. The systemic circuit begins in the left ventricle and concludes in the right atrium.

The pulmonary circuit refers to the circulation of blood between the heart and the lungs. The pulmonary circuit begins in the right ventricle and concludes in the left atrium.

The average heart at rest pumps approximately 72 beats per minute.

Patent Foramen Ovale

The condition known as Patent Foramen Ovale (PFO) is directly relevant to diving. While in the womb, there is no need for a pulmonary circuit as the foetus receives only oxygenated blood from the mother. Therefore, there is a flap in the septum (the tissue separating the atria) allowing blood move directly from the right atrium to the left atrium and straight onto the systemic circuit.



Approaching birth, this flap normally begins to close as there is a growing requirement for a pulmonary circuit. Problems arise when the flap does not fully close. This is referred to as an Atrial Septal Defect (ASD) and is present in approximately 25% of the population.

The ASD can be forced open due to reverse pressure e.g. a sneeze or the valsalva manoeuvre. If there is an opening, not only could deoxygenated blood get into the systemic circuit but microbubbles, which would normally be expired during the pulmonary circuit, could also get into the systemic circuit. Potentially expanding bubbles in the systemic circuit brings obvious potential danger.

Hypothermia

Hypothermia occurs when the *core* body temperature drops below normal core temperature of 37°C. Note the use of the word 'core' temperature. The core refers to the torso containing the vital organs. It does not refer to e.g. cold feet.

Hypo refers to a reduced level, in this case a reduced level of temperature.

The body is designed to operate at a temperature of 37°C. When the temperature drops below (or indeed above i.e. hyperthermia) this level, then normal operation can no longer take place.

Water conducts heat 25 times more than air. Obviously this has major implications for the diver immersed in cold water. In addition, water requires 1,000 times more energy than air to heat.

The hypothalamus, a gland located in the brain, controls body temperature. Effectively the hypothalamus is constantly sampling the temperature of the blood flowing through it.

If it detects a drop in temperature a process called vasoconstriction is initiated. The body starts to progressively reduce/restrict the flow of warm blood to non-critical parts of the body thereby conserving the warm blood for the vital organs. For example, the toes of the foot are obviously not as important as the heart. Therefore the toes will initially have their blood supply reduced. This is a progressive process thus maintaining at least a partial, warm blood supply to the vital organs. Hence, a victim may lose e.g. a toe or worse.

The opposite of vasoconstriction is vasodilation. Vasodilation will occur when a victim of hypothermia begins to become warm again and warm blood is allowed to travel progressively further from the core. However, vasodilation must occur in a controlled manner as excessive exposure of warm blood to cold tissues can dramatically and dangerously reduce the temperature of the blood and lead to shock.

As alcohol is a vasodilator, it is NOT given to victims of hypothermia despite the warm sensation it might give. Similarly, it is not recommended to rub the skin of a

victim as to do so will give a false message to the hypothalamus which could prematurely trigger vasodilation.

Symptoms

The progressive symptoms of hypothermia are: shivering, mental disorientation, cyanosis, clumsiness, spasms, drunken appearance/behaviour, unconsciousness and ultimately death. It is crucial that death is not assumed when encountering a case of hypothermia. The nature of the body's response to hypothermia (i.e. the progressive shutdown) could give the appearance of death which may not be true.

Re-warming a victim should only be done by professional medical personnel who will seek to initially heat the trunk of the body. One method is to immerse the trunk (keeping out the arms and legs) in a bath at 42°C. A victim of hypothermia is declared recovered when they begin to sweat.

Hypoxia, Anoxia and Drowning

Hypoxia refers to a partial reduction in the level of oxygen in the tissues.

Anoxia refers to a *total* absence of oxygen in the tissues.

As previously stated, brain tissue can survive approximately 3 minutes without oxygen. Therefore a victim of anoxia is obviously in a critical situation.

Hypoxia or anoxia can arise when either oxygen is not getting into the lungs or is not being adequately distributed from the lungs to the rest of the body. This may occur due to e.g. heavy bleeding, restricted breathing (e.g. pressure on throat, blockage), haemoglobin problem, heart disease, lung disease etc.

Haemodilution refers to water entering the bloodstream and diluting the blood. This drastically upsets the chemical balance in the blood and also increases the blood volume. It occurs through osmosis because the salt concentration is higher in the blood. Haemodilution occurs in a near-drowning incident in *freshwater*.

Haemoconcentration refers to water leaving the bloodstream thereby increasing the viscosity of the blood. This occurs because the salt concentration in sea water is

greater than that found in the blood. Blood volume is reduced but the chemical imbalances mentioned above are not as great. Therefore a near drowning victim in *saltwater* is in less grave danger of imminent heart failure.

Regardless of apparent recovery, near drowning victims **MUST** be removed to hospital for observation. This is due to the risk of secondary drowning arising (especially after a freshwater incident) when excessive water in the bloodstream is deposited back in the lungs potentially starting the whole drowning cycle again.

Shock

Clinical shock is a grave medical condition that refers to serious problems with the flow of blood in the body. It does not refer to the mental trauma or fright suffered after an incident. We often talk about "treating for shock." This normally entails the administration of a warm drink, the reassurance of a victim and keeping a victim warm. While this is very appropriate it is not the treatment required in the event of clinical shock.

Clinical shock takes three, progressive forms: compensated, progressive and decompensated (also known as irreversible).

At the compensated stage, the body is attempting to compensate for the blood loss e.g. body attempts to increase heart rate, vasoconstriction (explained under hypothermia above).

If untreated, the victim may progress into progressive shock the organs of the body start to suffer the effects, not only of the initial trauma, but also the effects of the body's own reaction to compensated shock.

The victim may potentially deteriorate further into decompensated shock also known as irreversible shock as the organs begin to fail and the victim dies.

Examples of types of shock relevant to divers include:

- Cardiogenic shock occurs due to problems with the heart e.g. heart disease or stroke.
- Hypovolemic shock occurs due to blood loss.
- Neurogenic shock occurs due to problems with the nervous system.

Connecting Laptops to Projectors

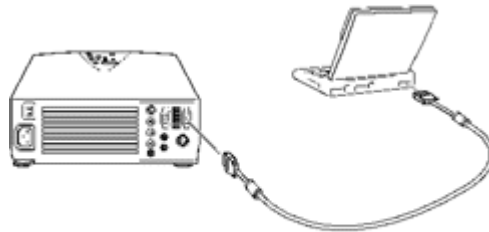
Connecting a laptop to a multimedia projector is a snap. Follow these quick steps, and you'll be presenting in no time!

Note

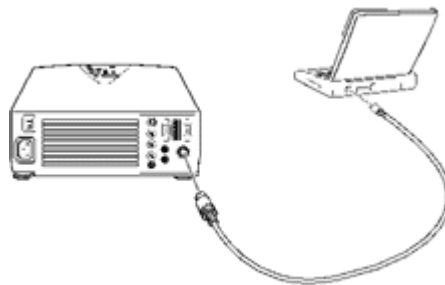
Laptop configurations vary. Consult your computer manual for the location of the ports needed to connect your projector.

To connect a PC laptop to a multimedia projector

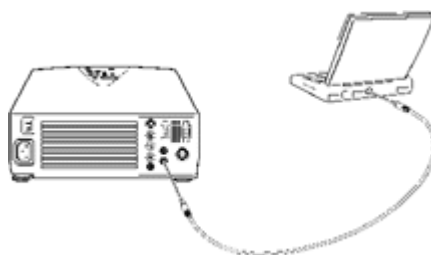
1. Before you begin, make sure your projector and laptop are turned off.
2. Connect the video cable.
 - o Connect either end of the video cable to the projector's **Computer In** port.
 - o Connect the other end of the video cable to the laptop's **Video** (monitor) port.
 - o Tighten the screws on both connectors to make sure they are fastened securely.



3. Connect the USB cable to use the remote control as a mouse pointer for the laptop.
 - o Connect the small end of the USB cable (normally included) with the projector to the projector's **USB** port.
 - o Connect the other end of the USB cable (normally included) with the projector to the laptop's **USB** port.



4. Connect the audio cable if needed (and if your laptop has an **Audio Out** jack).
 - o Connect one end of the audio cable to the **Audio In** jack on the projector.
 - o Connect the other end of the audio cable to the **Audio Out** jack on your laptop.



After connecting the video cable at both ends, you need to press and hold the "FCN" key and then press the CRT/LCD function key (mostly the F8 key) to send the signal from your Laptop the projector.

NOTE: some Laptops have a different CRT/LCD Function key, refer to your Laptop's user manual.



AND



You should now have the Laptop image projected on the screen.

Connecting PowerBooks to Projectors

Connecting a PowerBook to a multimedia projector is a snap. Follow these quick steps, and you'll be presenting in no time!

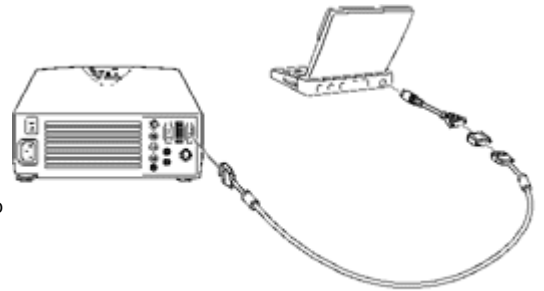
Note

Laptop configurations vary. Consult your computer manual for the location of the ports needed to connect your projector.

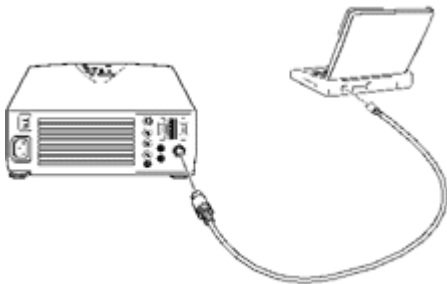
To connect a PowerBook to a multimedia projector

1. Before you begin, make sure your projector and laptop are turned off.
2. Connect the video cable.

- Connect either end of the video cable to the projector's **Computer In** port.
- Remove the small cover and set the DIP switches on the Macintosh desktop adapter to the resolutions you want to use (such as 16-inch mode).
- Connect the small terminal of the Macintosh desktop adapter to the other end of the video cable.
- Connect one end of the video-out cable included with your Macintosh to the **Video Out** connector on the back of the computer.
- Connect the other end of the Macintosh **Video Out** cable to the projector cable (with the adapter attached).
- Tighten the screws on both connectors to make sure they are fastened securely.



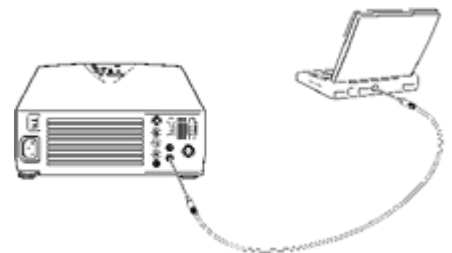
3. Connect the mouse cable to use the remote control as a mouse pointer for the laptop.



- Connect the small end of the Mac mouse cable included with the projector to the laptop's **Mouse** port.
- Connect the other end of the Mac mouse cable included with the projector to the projector's **Mouse/Com** port.

4. Connect the audio cable if needed (and if your laptop has an **Audio Out** jack).

- Connect one end of the audio cable to the **Audio In** jack on the projector.
- Connect the other end of the audio cable to the **Audio Out** jack on your laptop.



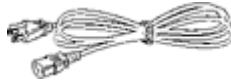
Projector Cables 101

Did you just borrow a projector from a colleague, or perhaps find yourself using an unfamiliar projector at a course? If so, you may take a look at all the cables in the projector case and wonder what is what.

So many cables and no idea which one to choose . . . What goes where? . . . Does it really matter? . . . This brief reference should help take the mystery out of all those projector cables.

Power Cord

Provide power to the projector.



Video Cable

Send the computer video graphics to the projector.



USB Cable

Allows you to use the projector remote control as a mouse.



Audio Cable

Allows you to send sound from your laptop to your projector. This cable looks just like a singular AV cable, shown below.

Audio/Video (AV) Cable

Sends the composite video source to your projector.



Connecting Projectors to Video Devices

Multimedia projectors are designed to display more than just computer images. You can connect a VCR, camcorder, laser disc player, or any other compatible video image source to your projector. You can use your projector as a multimedia entertainment centre!

Most projectors can receive composite video or S-Video. You can determine what type of video your projector can receive by performing the "pin" test. If your video source has a one-pin RCA video jack, your video equipment has composite video. If your video source has a four-pin video jack, your equipment has S-video.

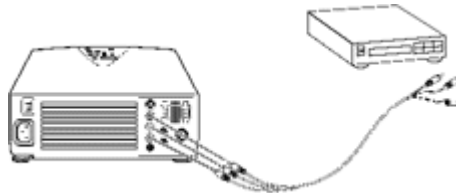
Projectors usually include an audio/video (AV) cable for composite video. Additionally, S-Video sources should come with an S-Video cable. If yours does not, you can purchase one.

To set up the video source

1. Before connecting the video source, make sure the projector and video source are turned off.
2. Locate the appropriate video cable. If the video source uses a small, round, one-prong composite (RCA) video connector, you need the audio video/cable included with the projector. If the video source uses a large, round, four-prong S-Video connector, you need the cable that came with the video source or you may need to purchase an appropriate one.

Composite video sources

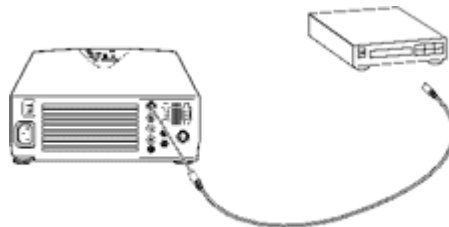
1. Connect the yellow RCA plug on one end of the audio/video cable to the projector's **Video In** jack. Connect the other yellow RCA plug to the **Video Out** jack of the video source.



2. Connect the other plugs on the audio/video cable to the **Audio** jacks of the projector.
 - o Insert the white plug into the **L** jack and the red plug into the **R** jack.
 - o Connect the plug at the other end of the audio/video cable to the audio output jacks of the video source.

S-Video Sources

1. Insert one end of an S-Video cable into the projector's **S-Video In** connector.
2. Insert the other end into the **S-Video Out** jack of the video source.



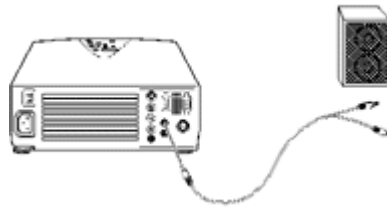
Connecting Projectors to Public Address Systems or External Speakers

Most multimedia projectors come with built-in speakers that you can use for small and medium-sized group presentations. However, if you are presenting to a large audience, you may want to connect your projector to an external PA system or to external speakers. This allows you to use the projector's built-in sound function — but also allows you enhanced sound output.

If you want to connect a projector to an external sound system, you need to obtain an RCA-to-3.5 stereo audio cable. You can get this cable from your local projector dealer or from an electronics store.

To connect a projector to an external sound system

1. Turn off the projector and external sound system.
2. Make the following connections:
 - o Connect the cable's 3.5 mm stereo mini-plug to the projector's **Audio Out** jack.
 - o Connect the RCA plugs to the external amplified speaker or PA system.
 - o Insert the cable's red plug into the **Audio R** jack. Insert the white plug into the **Audio L** jack.



3. Turn on the projector and sound system to test.

Setting Up Projectors and Determining Correct Image Size

Ever set-up your projector and find out you are either too far or too close to the screen to get the image size you want? The size of the projected image is determined by the distance between the projector and the screen (or whatever surface the image is projected on to). Here is a quick reference list to help you set up a projector to get the desired image size.

To set up a multimedia projector

1. Place the projector on a sturdy, level surface within five feet of the computer or video source.

Note

This distance is a general guideline that can vary depending upon the presentation.

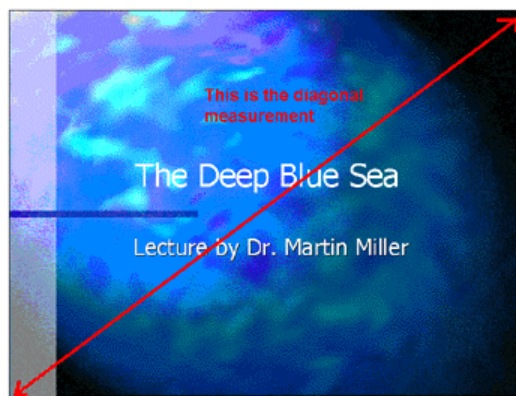
2. Place the projector of the proper distance from the screen. The distance between the projector and the screen determines the actual image size. Consult the table below to find the distance you need for your particular situation. The distance may vary slightly depending upon the projector. All measurements in the following table are listed in inches.

Digital Image Size	Minimum Distance	Maximum Distance
300	472.4	614.2
200	315.0	409.4
100	157.0	204.7
80	126.0	165.4
60	94.5	122.0
40	63.0	82.7
30	47.3	63.0
25	39.4	51.2

Note

The image size reflects the diagonal measurement.

- 3.



4. Make sure the projector is at a right angle to the screen. This ensures the image is not distorted.
5. Connect one end of the power cord to the projector's power connector. Connect the other end to the socket.
6. Turn on the projector to make sure the power connection works and to determine correct image size. Once you have adjusted the image size, turn off the projector so that you can connect the input devices (computer, video, audio, etc.).

The Mobile Presenter's Checklist

Picture this . . . The day before a big presentation, you are running around, trying to tie up loose ends. You think you have allowed plenty of time in the afternoon to pack your things and ensure you have all you need. Unfortunately, it's a crazy day, and you end up with 20 minutes to spare before you have go. You load your presentation on your laptop, pick up the projector, and head out the door. As your driving down the road, you realize you should have packed a backup disk of your presentation. Oops. Maybe you should have checked the projector case to make sure the cables are in there. And what about that remote? The last time you tried to use it, the batteries seemed to be on the blink.

You can avoid this mayhem and worry in the future. Just print out the list below and check off each item before you hit the road. If you have an assistant to help out, hand it to them and let them ensure that everything is covered.

Mobile Presenter Checklist

Presentation	<ul style="list-style-type: none"> • Presentation on disk • Backup of presentation on another disk (Note: If your presentation is zipped (.zip), make sure you test unzipping it before you hit the road!) • Hard copy of presentation
Laptop	<ul style="list-style-type: none"> • Power cord • Battery • Extra disks • User guide • Technical support number
Projector	<ul style="list-style-type: none"> • Projector • Power cord • Video cable • USB cable • AV cable • S-Video cable • Mac adapter (if applicable) • Remote control • Extra batteries (for the remote) • Spare projector bulb • Flathead/Phillips mini screwdriver set • User guide • Technical support number
Other	<ul style="list-style-type: none"> • Power adapters • Powerstrip • Extension cord (25ft) • Video cord (25ft)



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISE BRIEFING CARDS

<i>Guidelines for Instructors</i>	
Objective	Ensure student masters technique demonstrated to them.
Safety	Safety guidelines to be adhered to at all times, in and out of the water.
Equipment Required	<p>Basic – mask, snorkel, fins and weight belt if required.</p> <p>Scuba – BCD, cylinder, regulator with contents gauge, low pressure inflator hose, alternate air source (octopus, AIR 2), depth gauge (regulator console or independent).</p> <p>Pool suit if required (3mm recommended)</p>
Briefing	<p>Brief away from any distractions.</p> <p>Cover all specific hand signals and safety aspects of the exercise.</p> <p>Ensure students understand what is required of them.</p>
Exercise	Follow steps as per exercise required.
Instructor points	<p>Once exercise is completed ensure students leave pool first and Instructor exits last.</p> <p>Maintain class control in the deep end by having students hold onto pool bar when not engaged in exercise.</p> <p>Encourage students to observe demonstrations and practicals.</p>
Debrief	<p>Summarise exercise.</p> <p>Give constructive feedback to group and not to any individual.</p> <p>Encourage feedback</p> <p>Inform group of upcoming pool exercises and/or lectures.</p> <p>End on a high note by congratulating students on their achievement.</p>
Housekeeping	<p>Sign-off documents to be signed</p> <p>Remove all equipment with aid of students</p> <p>Replace any pool lane dividers if required and leave pool as found.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Snorkelling</i>
Objective	To enable the student to use basic equipment and master the technique of snorkelling.
Safety	Stress the importance watching where you are going
Equipment Required	Basic equipment, weight if required.
Pre-req Training	None required.
Hand Signals	Okay, Direction
Exercise	<p>Enter shallow end of pool.</p> <p>Holding on to side of pool lie on surface of water to start with.</p> <p>The body should be as streamlined as possible, lying just under the surface of the water. The head should be in line with the body, being neither too high nor too low. The water surface should touch the top of the mask (in or around the middle of the forehead), and usually the eyes look forward and slightly downward. The legs are under the water and the toes are pointed backwards.</p> <p>To guarantee efficient forward momentum and ease, a good finning stroke is essential for all snorkellers. The basic stroke is a continuous alternating up and down action generated from the hip. The knee is straight but not locked. The foot is straightened out and the toes are pointed backwards with just enough flexibility in the ankles to facilitate angling of the fin, for maximum efficiency as the blade sweeps against the water. This kick ensures that the largest possible area of the fin is brought to bear upon the water in a backward and downward direction. The depth of the kick varies among individuals, but should not reach much below the level of the body, usually about the length of one's step, heel to heel (two feet).</p> <p>Throughout the whole finning stroke the legs pass as closely to each other as possible. This helps to keep the thrust of the legs behind the body. During the upward kick the sole of the straightened fin and the back of the leg press upward. Throughout its upward drive, the leg is kept as straight as possible. Care should be taken to ensure that the fins are not raised above the surface of the water or much of the available thrust will be wasted. Therefore, when finning, ensure that the kicking action is powerful but slow and rhythmic, and the fins do not come out of the water. It should be emphasised that "practice makes perfect".</p> <p>Once the finning procedure is correct, advance the exercise by now finning lengths of the pool.</p>
Instructor notes	Watch students from in and out of the water, correcting technique. This is the basis for efficient use of energy for both snorkelling and on scuba.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Surface Dives</i>
Objective	To enable the student to confidently dive down underwater with the minimum of effort.
Safety	Stress the importance watching where you are going, ear clearing, and mask squeeze.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Basic Snorkelling.
Hand Signals	Okay; Down; Up
Exercise	<p>Assemble basic equipment.</p> <p><u>Head first snorkel dive</u></p> <p>Enter deep end of pool.</p> <p>Holding on to side of pool lie on surface of water to start with.</p> <p>From the basic glide position described earlier, with the hands extended forward, bring the chin to the chest and bend sharply downwards from the waist, pointing the hands towards the bottom. At the same time lift both legs together, upwards. Pull the hands (breast stroke fashion) to the side and glide to the bottom using the legs to assist when the fins are submerged.</p> <p>Once underwater, a snorkeller must resurface. This is best achieved by ascending in a spiral fashion with one arm held high over the head. The snorkel diver can then observe the surroundings and prevent the head striking some surface object such as a boat. During the ascent listen for the engine noise of any oncoming boat. On reaching the surface, the "OK" hand signal is given.</p> <p><u>Legs first snorkel dive</u></p> <p>Enter deep end of pool.</p> <p>From the treading water position kick the legs vigorously until the body raises the chest high above the water. Stop fining, the body then adopts a vertical stiff attention position and sinks back under the water. By bending the legs backwards from the knees, and the body forward from the waist and the hands upward and forward, a near horizontal position will be achieved from which to fin away.</p> <p>Once underwater, a snorkeller must resurface. This is best achieved by ascending in a spiral fashion with one arm held high over the head. The snorkel diver can then observe the surroundings and prevent the head striking some surface object such as a boat. During the ascent listen for the engine noise of any oncoming boat. On reaching the surface, the "OK" hand signal is given.</p>
Instructor Notes	Correct technique is important, this will make a number of future exercises more easily achievable



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Mask & Snorkel Clearing</i>
Objective	To enable the student deal with a flooded mask or snorkel without getting into difficulty, thus increasing confidence in the water.
Safety	Stress the importance of staying calm and relaxed.
Equipment Required	Basic equipment, weight if required.
Pre-req training	Basic snorkelling and snorkel dives.
Hand Signals	Okay, Up Down, Something wrong.
Exercise	<p>MASK CLEARING</p> <p>This is best done kneeling in shallow end (it is hard to remain under water to practice the procedure).</p> <p>Either apply pressure to the top of the mask by placing the palm of one hand on top of the mask or lift the bottom edge of the mask away from the face. Then gently exhale through the nose, slowly and continuously while tilting the head backwards. (By blowing out before tilting the head no water will go down the back of the throat). The air replaces the water, forcing the water out through the bottom of the mask. The process may have to be repeated to fully clear the mask.</p> <p>Apply pressure to the top of the mask by placing the palm of one hand on top of the mask. Gently exhale through the nose, slowly and continuously while tilting the head backwards. (By blowing out before tilting the head no water will go down the back of the throat). The air replaces the water, forcing the water out through the bottom of the mask. The process may have to be repeated to fully clear the mask.</p> <p>SNORKEL CLEARING</p> <p>Clear the snorkel while ascending from a dive by exhaling forcefully and quickly while tilting the head back. Start just before you break the surface of the water.</p> <p>Inhale slowly following clearing in case there is a small amount of water remaining in the snorkel, and then exhale again while tilting the head back. If water remains in the snorkel the process can be repeated on the surface until the snorkel is clear. Inhaling a mist of water vapour can cause lung damage; effective snorkel clearing should be achieved in one or two exhalations.</p>
Instructor Notes	Snorkel clearing only necessary on reaching the surface, but point out a flooded mask can happen underwater on scuba. Easier to clear on scuba as can take a breath.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Ditch & Recovery of Mask & Fins</i>
Objective	Increases student confidence in water and encourages familiarity with equipment.
Safety	Stress the importance watching where you are going and ear clearing.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Snorkelling skills / snorkel dives / mask & snorkel clearing.
Hand Signals	Okay, Up, Down, Something wrong.
Exercise	<p>Place the mask and fins on the bottom of the pool.</p> <p>Perform a headfirst surface dive and locate the mask.</p> <p>Fit the mask by placing it over the face and pulling the strap over the head.</p> <p>Identify the correct way up by Either either feeling for the nosepiece or the side the snorkel is worn (check before placing on the pool bottom!).</p> <p>Clear both the mask and snorkel while ascending.</p> <p>Perform a second headfirst surface dive to the bottom of the pool, where it is easier to turn and 'sit' on the pool bottom to retrieve the fins. Fit & secure one fin then the second.</p> <p>Ascend not forgetting to clear the snorkel.</p>
Instructor points	Break up into sections – fit mask and fins separately until student is confident with fitting equipment.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Entries</i>
Objective	To enable the student to confidently entry the water on snorkel or using scuba from a variety of platforms.
Safety	Stress the importance watching where you are going, the depth of water, possible underwater obstacles, other divers in the water. Use Deep end only in the pool.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Ear Clearing.
Hand Signals	Okay.
Exercise	<p>Exercises performed in the deep end (minimum 1.8m) and on snorkel only.</p> <p>The Silent Entry. Sitting on the pool edge with the legs in the water, turn the body sideways and place both hands, palms down, on the deck. Take the weight off the body onto the hands and at the same time slowly slide into the water. Used when unsure of the depth of water or unknown underwater obstacles that may cause injury</p> <p>The Step-in. From a standing position, step into the water with the legs stretched as widely as possible, then draw them forcibly together on entry. Hold the mask in place with one hand with the elbow tucked in. On scuba the second hand will hold the BCD down at the back to prevent the cylinder hitting the back of the head. Used from bank no more than 1m above the water.</p> <p>The Vertical Entry. From the "standing to attention" position, jump into the water keeping the legs straight and together. Hold the mask with one hand with the elbow tucked in. On scuba the second hand must hold the BCD down at the back to prevent the cylinder hitting the back of the head. Used from bank no more than 3m above the water.</p> <p>The Backward Roll Entry. Squatting with back to the pool, buttocks over the edge, bring the knees and chin to the chest, hold mask with one hand, tank with other when on scuba and roll into water backwards. Used to exit the boat, no more than 1m above the water.</p> <p>The Forward Roll Entry. Standing in the crouched position, facing the pool, spring forward from the knees, holding the mask with one hand, with elbow tucked in, and, when on scuba, the tank with the other hand. Flick over, landing on the back. Used to exit the boat no more than 1m above the water.</p> <p>For all the entry methods ensure point of entry is clear before proceeding; on entry, surface once in the water and give clear OK signal.</p>
Instructor Notes	Watch students from in and out of the water, correcting technique. Entries will be practiced on scuba during the first dives. If the pool is not deep enough to perform entries they must be done during the first five snorkels.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Forward & Backward Roll</i>
Objective	To enable the student to gain control and mobility in the water, and feel comfortable in water when at any angle.
Safety	Stress the importance watching where you are going, taking care if disorientated not to hit the pool bottom.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Basic Snorkelling, Snorkel clearing, Snorkel dives.
Hand Signals	Okay, Down.
Exercise	<p>Enter deep end of pool,</p> <p>Forward Roll - lie on surface and execute a 'head first' snorkel dive. When fingers almost touch the bottom of the pool tuck the body into a ball with chin and knees into the chest and heels up to the buttocks. Straighten both arms out to the sides, palms outstretched, and rotate arms in opposite direction of roll. Use lines on bottom of pool to maintain position. Propel the body round using the arms.</p> <p>Backward Roll – lie on surface and execute 'head first' snorkel dive. When fingers almost touch the bottom of the pool arch body with head back, trying to meet the tips of the fins. Straighten both arms out to the sides, palms outstretched, and rotate arms in opposite direction of roll. Use lines on bottom of pool to maintain position. Propel the body round backwards using the arms.</p>
Instructor Notes	Watch students from in and out of the water, correcting technique. Attempt one roll initially, allowing the students to build up to three.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Snorkelling 25m with no mask</i>
Objective	To enable the student to confidently snorkel on the surface in the event of losing a mask.
Safety	Stress the importance watching where you are going, protect the head by outstretching the arms. Breathe through mouth only
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Basic Snorkelling.
Hand Signals	Okay, Direction, Stop.
Exercise	Enter deep either end of pool, Place the mask on forehead maintaining snorkel in mouth. Fin on the surface for 25m breathing through mouth (snorkel) only. Keep eyes open and follow line in pool, hands/arms outstretched to front in case of unforeseen obstruction.
Instructor Notes	Watch students from in and out of the water, correcting technique. Emphasise the need to breathe through mouth only. Allow students to build up confidence.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Fin25m underwater with no mask</i>
Objective	To enable the student to confidently swim a distance underwater, and to learn to remain calm in the event of losing a mask.
Safety	Stress the importance watching where you are going, ear clearing, protecting the head. Take care not to hyperventilate.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Basic Snorkelling, Snorkelling no mask, Surface dives.
Hand Signals	Okay, Direction, Down, Stop.
Exercise	Enter either end of pool, easier from the deep end. Remove mask and snorkel and place on pool bank. Take breath and execute 'head first' snorkel dive. Keeping eyes open, and following line in pool, hands/arms outstretched to front (in case of unforeseen obstruction), fin 25m. Surface and return to recover mask and snorkel.
Instructor Notes	Let student achieve the full exercise in stages, fin underwater with mask, half distance. This is a breath hold exercise, and often the barrier is psychological.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Tow 50m plus EAR</i>
Objective	To enable the student to tow a non breathing victim to safety.
Safety	Keep the victim afloat and head out of the water.
Equipment Required	Basic equipment, weight if required.
Pre-req Training	Snorkelling.
Hand Signals	Okay, Direction, Stop, Something wrong.
Exercise	<p>Enter the shallow end of the pool.</p> <p>Lay 'victim' on back on surface of water. If a buoyancy aid is worn this may be inflated, but should not prevent the achieving of a head tilt. Remove mask and snorkel. Create airway by using arm nearest victim's head to pinch the nose also achieving head tilt. Use other arm to turn 'victim' towards you, then administer breaths from mouth to mouth, every five seconds.</p> <p>When breathing rhythm is established, begin finning.</p>
Instructor Notes	Watch students from in and out of the water, correcting technique. Emphasis should be on getting victim to safety, mouth to mouth is a useful skill if help is on the way. Great distances are difficult to achieve.



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Assembly of Scuba equipment</i>
Objective	The exercise is designed to allow the student learn how to put together a SCUBA unit.
Safety	<p>Hold pressure gauge away from face when opening valve.</p> <p>Use good manual handling technique when working with cylinders.</p> <p>Cylinders should be stored lying down when not in use.</p>
Equipment Required	Scuba equipment to include octopus.
Pre-req training	Lecture on scuba equipment preferred.
Hand Signals	None necessary.
Exercise	<p>Identify the components, pointing out the differences between A clamp and DIN fittings on both the cylinder and the first stage.</p> <p>Slide the BCD onto the cylinder from the top, making sure that the valve opening on the cylinder faces towards the front of the BCD. The nylon strap should be placed 8-10inches below the cylinder valve. Secure the band by tightening as far as you can by hand then swinging over the locking buckle. Check to ensure that the cylinder does not slip or slide by lifting the BCD.</p> <p>Check the cylinder valve opening to make sure that there is an 'O' ring in place for an A clamp assembly.For a DIN fitting check the 'O' ring on the first stage (remove the dust cap if present).It should be clean and free of nicks and cuts. Replace if necessary. Open the cylinder valve slowly, for a quick burst of air, to clear any water/dirt/dust from the valve opening. For an A clamp fitting remove the regulator dust cap by loosening the screw and place the first stage over the cylinder valve so that the valve opening meets the first stage opening.The DIN first stage screws directly into the cylinder valve. The second stage hose must lead over the right shoulder of the BCD. Tighten the screw until it is just finger tight. Attach the low-pressure hose from the first stage to the BCD inflator.</p> <p>Hold the contents gauge in your hand with the face away from you and you turn on the air slowly. If you hear air escaping from any part of the assembly turn off the air.Assuming no air leaks then open the valve all the way then making a _ turn back.</p> <p>Check to make sure that you have enough air for the dive. Take a couple of breaths from the regulator to make sure the gauge needle remains steady and the regulator is working ok.Check air for taste, may indicate a 'dirty' fill.</p>
Instructor Notes	<p>Explain that BCD's and regulators vary according to make.</p> <p>Point out the differences between A clamp and DIN fittings.Fittings on BCD may differ, check LP hose.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Disassembly of Scuba equipment</i>
Objective	The exercise is designed to allow the student learn how disassemble a SCUBA unit.
Safety	Use good manual handling technique when working with cylinders. Cylinders should be stored lying down when not in use.
Equipment Required	Scuba equipment to include octopus.
Pre-req Training	Lecture on scuba equipment preferred.
Hand Signals	None necessary.
Exercise	<p>Turn off the air by turning the cylinder valve until hand tight.</p> <p>Press the purge button slowly on the regulator 2nd stage to release the pressure in the 1st and 2nd stage regulators and hoses.</p> <p>Disconnect the low-pressure hose from the BCD.</p> <p>Remove the 1st stage regulator from the cylinder by turning the A clamp screw anti-clockwise, being careful not to allow any water to enter through the filter of the 1st stage.</p> <p>Dry the dust cap by giving it a quick blast of air from the cylinder or by drying with a cloth and replace the dust cap.</p> <p>For a DIN fitting unscrew (anticlockwise) the first stage from the cylinder and replace cap, drying it if necessary.</p> <p>Remove the BCD from the cylinder first loosening the strap.</p> <p>Rinse all equipment in fresh water. Do not depress the purge button of the 2nd stage underwater if the system is not under pressure as this will allow water to enter the hose.</p> <p>Regulator should be hung up to dry, with no kinks in the hoses.</p> <p>The BCD should be hung up to dry away from direct sunlight.</p>
Instructor Notes	<p>Be careful of losing O ring when blowing dust cap.</p> <p>Unit can be washed as a whole, keep unit pressurised while doing so.</p> <p>Rinse bladder of BCD occasionally, draining using the dump valves.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Mask and Demand Valve Clearing</i>
Objective	Teaches the student to remain calm if the mask floods or is lost and to confidently expel water or other matter from the DV in order to breathe properly.
Safety	Stress the importance of staying calm, ear clearing and breathing out at all times DV not in mouth, and especially when surfacing
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required.
Pre-req Training	Basic introduction (Try-a-dive).
Hand Signals	Okay; Down; Up; Assemble; Something wrong; Stop.
Exercise	<p>Enter shallow end of pool and proceed to the deep end</p> <p>Once settled on the bottom remove the mask and hold at arms length, replace mask. Identify the correct way up using the location of the nose piece and snorkel for guidance.</p> <p>There are two methods for clearing the mask:</p> <p>EITHER: apply pressure to the top of the mask by placing the palm of one hand on top of the mask.</p> <p>OR: lift the bottom edge of the mask away from the face, using one or two hands</p> <p>Then gently exhale through the nose, slowly and continuously while tilting the head backwards. (By blowing out before tilting the head no water will go down the back of the throat). The air replaces the water, forcing the water out through the bottom of the mask. The process may have to be repeated to fully clear the mask.</p> <p>When this skill is achieved with confidence remove the mask and swim underwater for 25m without mask and replace as above.</p> <p>There are two methods of clearing a demand valve: using the purge button to clear debris from mouthpiece; OR blowing out whilst DV in mouth to clear water from mouthpiece.</p> <p>Using the purge button</p> <p>While standing, hold second stage firmly in one hand and extend arm out to side at full stretch. Keep the mouthpiece of the DV pointed downwards to help prevent free flow. Blow out through mouth gently whilst DV is out of mouth.</p> <p>Depress the purge button, expelling air, and return to mouth. Invite the trainee to do likewise. When trainee is comfortable with the exercise, submerge and repeat underwater. Surface and return to bank.</p> <p>Blowing out</p> <p>DV can easily be cleared of water by blowing out into the DV whilst in the mouth. Underwater remove DV from mouth, keeping it turned downwards to prevent free flow. Exhale gently through mouth when DV is out of the mouth. Return the DV to the mouth; blow out gently through the mouthpiece clearing the water. Inhale slowly to ensure all water is clear.</p>
Instructor Notes	Watch students in the water, correcting technique. Care removing mask for first time, remind student to breathe through mouth



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Buddy Breathing and sharing air including demand valve retrieval</i>
Objective	The exercise is designed to allow the student to experience buddy breathing and sharing air in a controlled environment. The skills are required in an emergency situation therefore it is important to be able to perform them in a calm and relaxed manner. The demand valve retrieval exercise encourages the dive to locate the demand valve in a calm and controlled manner.
Safety	Equalise mask and ears on descent. Exhale on ascent. Exhale gently while regulator is not in mouth
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required.
Pre-req Training	Demand valve clearing. Burst Lung lecture.
Hand Signals	Okay, Up, Down, Direction, Something wrong, Out of air.
Exercise	<p>Enter the water in the shallow end, practice the exercise standing, and then in the shallow end before proceeding to the deep end.</p> <p>Buddy Breathing:</p> <p>The two divers should be facing each other; slightly side on is most comfortable. The donor, on receiving an out of air signal, should firmly grasp the recipient's jacket with their left hand. The recipient should do likewise with their right hand.</p> <p>The donor offers the regulator (purge button free), retaining a firm hold. The regulator should be passed with mouthpiece facing down to avoid free flow.</p> <p>The recipient should place their hand over the donor's hand on the 2nd stage. Not only does this give a certain amount of comfort that the recipient has access to air, but it is also easier for the recipient to guide the regulator into their mouth. The recipient blows out through the regulator to clear water and takes two breaths, counting may be done by raising a finger as each breath is inhaled. The purge button can be used if the recipient is unable to clear the 2nd stage.</p> <p>On complete inhalation of the second breath the donor removes the 2nd stage and proceeds to take two breaths in the same manner as above.</p> <p>Each diver must gently blow out when the 2nd stage is not in his or her mouth. This is a skill used in an emergency and the two divers would be ascending, therefore they must be aware of the dangers of a barotrauma.</p> <p>Eye contact must be maintained between the two divers at all times.</p> <p>Continue with exchanging the 2nd stage until a regular rhythm has been established.</p> <p>Once the Instructor has demonstrated the exercise, the roles should be reversed, with the student becoming the donor. The Instructor must correct the student during the exercise in order to establish a good technique.</p>

<p>Exercise cont'd</p>	<p>Sharing Air:</p> <p>The two divers should be facing each other. The donor, on receiving the 'out of air' signal, firmly grasps the recipient and hands over the octopus regulator. The recipient takes the octopus, whilst also holding onto the donor. The two divers are now breathing from the same cylinder at the same time.</p> <p>Once the student is proficient in both skills the Instructor can lead the student along the bottom of the pool to simulate an ascent. This gives the idea of the importance of establishing a good technique and a regular rhythm. Whilst sharing air the two divers can swim normally along side each other. It is up to the recipient to hold onto the octopus!</p> <p>Demand valve retrieval:</p> <p>When the buddy breathing exercise is complete the recipient will need to retrieve the demand valve. Using the right arm the student should conduct a wide sweeping action, beginning at hip level moving upwards and slightly behind the diver. The demand valve, feeding over the right shoulder, will be collected using this method allowing the diver to calmly replace the demand valve in his or her mouth. The demand valve can then be cleared.</p>
<p>Instructor Notes</p>	<p>Emphasise this is a skill to be used in an emergency situation. Candidates must exhale continuously when they don't have a regulator. Remind candidates to exhale by tapping the BCD. Explain the disadvantages of buddy breathing and sharing air. Explain the need for a firm hold on jacket and regulator.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Removal and Replacement of scuba underwater</i>
Objective	The exercise is designed so that students gain confidence in their abilities and become familiar with the equipment. It is important to be able to remove scuba gear in an emergency and it is necessary when undertaking boat dives.
Safety	Equalise mask and ears on descent. Exhale on ascent.
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required.
Pre-req Training	Demand valve clearing. Mask clearing Snorkel ditch and recovery.
Hand Signals	Okay, Up, Down, Something wrong, Direction.
Exercise	<p>Exercise to begin in the shallow end, students should fin on the surface in full gear to the deep end. Descend.</p> <p>On the bottom loosen shoulder straps of scuba unit.</p> <p>Undo chest and belly straps.</p> <p>Remove scuba unit.</p> <p>Lay scuba unit on tiles tank side down and kneel astride tank holding it with your knees (to aid against possible positive buoyancy).</p> <p>Retain the second stage continuing to breathe from it.</p> <p>Remove fins and place under tank (to prevent them floating away).</p> <p>Remove mask and lay on tiles beside kit.</p> <p>Turn air off and lay demand valve, mouthpiece downwards on tiles, straightening out hose to full stretch away from kit (so it is easily spotted on return without mask).</p> <p>Surface, exhaling continuously, with your arm raised above your head.</p> <p>Take a few breaths on the surface and dive back down.</p> <p>Make contact with scuba unit.</p> <p>Turn air back on; purge demand valve and place in mouth, remembering it is routed over the right shoulder.</p> <p>Kneeling astride the tank holding it with your knees, locate, refit and clear mask.</p> <p>Put one arm into BCD, and roll over onto back and put in other arm. Do up chest and belly straps and tighten shoulder straps to fit.</p> <p>Replace fins.</p>
Instructor Notes	<p>Student must exhale continuously during ascent.</p> <p>A small weight may be used to keep the fins/mask on the bottom.</p> <p>The demand valve should not be purged when the air is turned off.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Buoyancy control</i>
Objective	The exercise is designed to teach the candidate the benefits of good buoyancy control. Buoyancy control is essential both on the surface and at depth. On the surface it may be necessary to hold the head out of the water of a conscious or unconscious diver. The effects of pressure affect buoyancy underwater
Safety	Equalise mask and ears on descent. Exhale on ascent.
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required.
Pre-req Training	Buoyancy lecture. BCD familiarisation.
Hand Signals	Okay, Up, Down, Direction, Something wrong.
Exercise	<p>There are two methods of achieving buoyancy control – direct feed and oral inflation. Firstly demonstrate the deflation of BCD using dump hose and dump valves, with emphasis that the hose must be lifted vertical in order for the air to escape. Identify use of dump valves: on shoulder for quick dumping of air – hard to control; kidney dump for quick dumping of air if inverted. Ensure the student has identified all dump valves on the BCD and understands the use..</p> <p>On the surface demonstrate direct feed inflation of BCD by depressing direct feed button.</p> <p>Underwater lie, stomach down on the pool bottom, and inflate BCD for 1-2 seconds via the direct feed. Wait for effect of inflation, gently adding more air if no response. When body begins to rise, hold position and then gradually dump air until gently settles on pool bottom.</p> <p>On the surface demonstrate oral inflation of BCD by breathing in from 2nd stage and exhaling into mouthpiece of the BCD. Identify dump button to depress when exhaling to allow air to enter BCD.</p> <p>Underwater lie, stomach down on the pool bottom, and inflate BCD for 1-2 seconds via oral inflation method. Wait for effect of inflation, adding more air if no response. When body begins to rise, hold position and then gradually dump air until gently settles on pool bottom.</p> <p>Repeat one method of inflation and use the shoulder dump valve to demonstrate dumping of air quickly as required in a rapid ascent.</p>
Instructor Notes	<p>Describe lag in effect of inflation.</p> <p>Emphasise dangers of overdoing the inflation causing rapid ascent.</p> <p>Emphasise danger of over-dumping causing diver to descend.</p> <p>Inflate BCD in short bursts until proficient.</p> <p>Point out neutral buoyancy achieved when breathing in causes body to rise, and breathing out causes it to sink.</p> <p>Water will enter if the deflate button is held down underwater.</p>



Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Out of air</i>
Objective	The exercise is designed to allow the student to experience the feeling of running out of air. This is an emergency situation and is best practiced in a controlled environment.
Safety	Equalise mask and ears on descent. Exhale on ascent.
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required.
Pre-req Training	Demand valve clearing. Buddy breathing exercise.
Hand Signals	Okay, Up, Down, Something wrong, Direction, Out of air.
Exercise	Enter shallow end of pool. Perform the exercise in the shallow end before proceeding to the deep end. Submerge and establish a comfortable breathing rhythm. Exchange OK signals and then signal for the exercise to start. Instructor closes the valve on the student's cylinder. Maintain eye contact. Student breathes until air is exhausted. Student signals 'Out of Air' to instructor and they commence buddy breathing. Establish a buddy breathing rhythm and ascend. On the surface, student should orally inflate BCD to achieve positive buoyancy. Discuss any problems that may have been encountered.
Instructor Notes	Emphasise this is a rescue skill, that will be required in an emergency. Must exhale continuously during ascent. Summarise the buddy breathing skills and oral inflation of the BCD.

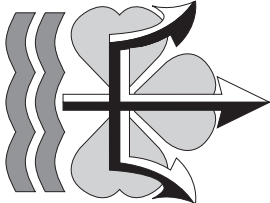


Instructor* (C.M.A.S. Moniteur *)

POOL EXERCISES

POOL EXERCISE	<i>Surface Marker Buoy (SMB) deployment</i>
Objective	The exercise is designed to allow the student to practice sending an SMB to the surface. This is a safety skill for use in open water, to enable those on the surface to identify your position.
Safety	Equalise mask and ears on descent. Exhale on ascent. Forcibly exhale on ascent if being brought to the surface by the SMB. Do not attach SMB to your equipment while deploying. Exhale gently when regulator is not in mouth.
Equipment Required	Basic equipment. Scuba equipment to include octopus. Weight if required. SMB Reel or length of cord with weight on the end.
Pre-req Training	Demand valve clearing. Buoyancy control.
Hand Signals	Okay, Up, Down, Something wrong, Stop.
Exercise	Once settled on the bottom of the pool in the deep end unroll the SMB, so it is ready to deploy. Do not attach SMB to any part of your equipment. In either a kneeling position, or lying on the bottom of the pool prepare to inflate the S.M.B. Using an Air 2, octopus regulator, main regulator or its' own mini cylinder fill the S.M.B. with air. If a reel is attached ensure to keep the trigger released, so only the S.M.B. goes to the surface and not the person. If using a line, allow the line to run through the hand, without holding it. If at any stage the reel or the line becomes entangled they must be released. Using the wind up mechanism on the reel take up the slack line and slowly reel towards the surface. Repeat the above exercise until proficient.
Instructor Notes	Candidates must exhale continuously if brought to the surface by SMB. A weight belt may be useful to keep on the bottom. Shallow pools will be harder to do the exercise in. Air expands on ascent so no requirement to fill on the bottom. Explain in what situations SMBs are used (drift dive, decompression, boats overhead). This skill can be performed on the ascent when confident.

Course Attendance Record Sheet

											Name	
											Fees, etc.	Subscription
											Fees, etc.	Training Fee
											Fees, etc.	Medical
											Fees, etc.	X-Ray
											Fees, etc.	Log Book Issued
											Fees, etc.	Students Handout
											Pool Exercises	Snorkelling
											Pool Exercises	Surface Dives
											Pool Exercises	Mask and Snorkel Clearing
											Pool Exercises	Ditch & Recovery of Mask and Fins
											Pool Exercises	Entries - on snorkel only
											Pool Exercises	Forward & Backward Roll
											Pool Exercises	Snorkelling 25m with no mask
											Pool Exercises	Fin 25m underwater with no mask
											Pool Exercises	Tow 50m plus EAR
											Pool Exercises	Assembly of Scuba Equipment
											Pool Exercises	Disassembly of Scuba Equipment
											Pool Exercises	Mask and Demand Valve clearing
											Pool Exercises	Buddy Breathing/Sharing Air & DV retrieval
											Pool Exercises	Removal & Replacement of Scuba u/w
											Pool Exercises	Buoyancy Control
											Pool Exercises	Out of Air
											Pool Exercises	Surface Marker Buoy Deployment
											Diver* Lectures	Course and CMAS
											Diver* Lectures	Hand Signals
											Diver* Lectures	Introduction to Dive Physics
											Diver* Lectures	Diving Equipment
											Diver* Lectures	Decompression
											Diver* Lectures	Out of Air
											Diver* Lectures	Effects of Pressure
											Diver* Lectures	Buoyancy
											Diver* Lectures	Dive Tables
											Diver* Lectures	Cardio Pulmonary Resuscitation
											Diver** Lectures	
											Diver** Lectures	Gas Laws
											Diver** Lectures	Ears and Sinuses
											Diver** Lectures	Hypothermia
											Diver** Lectures	Hypoxia, Anoxia and Drowning
											Diver** Lectures	Burst Lung
											Diver** Lectures	Respiration and Circulation
											Diver** Lectures	Dive Computers
											Diver** Lectures	Regulators and Cylinders
											Diver** Lectures	Dry Suit
											Diver** Lectures	Dive Planning
											Diver** Lectures	Small Boat Diving
											Diver** Lectures	The Sea
											Diver** Lectures	Night Diving
											Diver** Lectures	Our Environment