

# Skills for Expeditions in Remote Countryside (SFEIRC)



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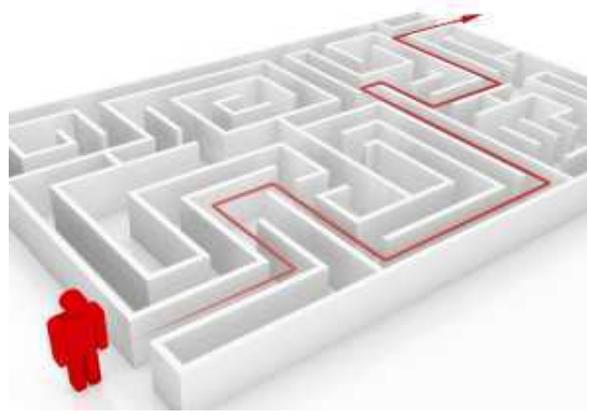
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## **1. Introduction, Aims, Intended Audience, Terrain**

This book is aimed at Senior Scouts, aged between 15-18 and for older Scouters looking to take part in the Discovery Award and /or the DofE Gold Award.

It is to be read in conjunction with the 2 day 'Skills For Expedition In Remote Countryside' training course. However, with the exception of the 'advanced navigation' the majority of the content is relevant for First Class Hike and Bronze Duke of Edinburgh Award.



I have tried to compile this so that it can be read and understood before, during and after attending the course. It is probable that a young scouter will 'grow' into this book as they develop their expedition skills and their scouting career. You are not expected to understand it all but there should be something here for all levels.

The course itself can further discuss any subject in more detail and provide a safe environment to develop the practical skills required.

It may also be used as a reference manual for Scout Masters to train scouts for expeditions. I have tried to include as many diagrams as possible to explain a point. It is still in DRAFT format until everyone who manages and teaches expedition work has had a chance to read and comment on it. Therefore there will probably be errors in this version. Please email them to me and I will try to get them changed as soon as possible.

I do not pretend to be an authority on any subject covered here. My main achievement was writing a table of contents that personally I think all expedition participants should know about. I then found or wrote material that explained that particular subject. There is no point in trying to 'reinvent the wheel'. Therefore approximately 40% of the content has been copied/ heavily influenced from various internet & printed book sources. Where possible I have referenced the sources.

A big thank to Tina and Emily for 'proof reading' and input from various scouters on content.

As far as suitable expedition environment, this document is suitable for Terrain 0 & 1, but not Terrain 2. These are defined as:

### **Terrain Zero:**

Terrain which meets **all** the following criteria:-

- is less than 500 metres above sea level
- is within 30 minutes travelling time from a road which can take an ordinary road going ambulance, or a building which is occupied (such as a farm) or another means of summoning help (such as an operational telephone box)
- contains no element of scrambling (see later for definition of 'scrambling')

### **Terrain One:**

Terrain which meets **any** of the following criteria:-

- is less than 800 (but 500 or more) metres above sea level, or
- is more than 30 minutes, but less than 3 hours travelling time from a road which can take an ordinary road going ambulance, or a building which is occupied (such as a farm) or another means of summoning help (such as an operational telephone box), and
- the route may pass through rough or rocky ground, but must contain no element of scrambling (see later for definition)

Recommended party size, no less than 4 and no more than 7.

**Note: No Beaver or Wolf Cub activity should take place in Terrain One, without meeting all the following criteria:**

- Specific approval by the Area Commissioner (home AC and activity location AC)
- Activity supervised by a Safety in the Hills Certificate holder or MLTE Walking Group Leader, who has undertaken an activity specific risk assessment.

**Terrain Two: (NOT SUITABLE FOR THIS BOOK) is Terrain which meets any of the following criteria**

- is 800 metres above sea level or more, or
- requires an element of scrambling, or
- lies more than 3 hours travelling time from a road which can take an ordinary road going ambulance, or a building which is occupied (such as a farm) or another means of summoning help (such as an operational telephone box).

Recommended party size, no less than 4 and no more than 7.

**Note: No Scout or Senior Scout activity should take place in Terrain Two, without meeting all the following criteria:**

- Specific approval by the Area Commissioner (home AC and activity location AC) and HQ Commissioner for the section
- Activity supervised by an MLTE summer ML or winter ML as appropriate, who has undertaken an activity specific risk assessment.

### **Scrambling**

Routes that the average Scout or leader would need to use their hands at least for balance, if not for actual progress. This does not stop people from using their hands as an aid to confidence. The leader of any party on a scrambling route must be fully conversant with the use of a confidence rope and be able to offer sound help and advice to a nervous participant. Every member of the party should have previous hill walking experience and, if a difficult scrambling route is being attempted, experience of easier routes.

### **Winter**

means when winter conditions, including snow and ice, prevail or are forecast; this cannot be defined by a portion of the year. Summer means any condition not covered under "winter"

## **2. The DofE 20 point check list**

For DofE there are 20 conditions that need to be met. They are all sensible and therefore it is a good place to start in expedition training for DofE and Discovery Award.

Please note they may not be the same as the Scouting rules for an expedition.

The summary of the 20 conditions of the Expedition section:

1. must be own physical effort
2. self sufficient
3. remotely supervised by an adult
4. must have an aim/ project
5. be properly equipped
6. complete required training
7. practice must be same mode of travel
8. team must plan the expedition
9. Assessment by approved assessor
10. between 4-7 participants (max 8 for water)
  
11. must be right age for qualifying
12. same level of assessment
13. no one who has passed that or higher level
14. should be by camping
15. must be correct duration
16. normally between March and October
17. must be in suitable environment
18. must be correct time on activity
19. must cook each day
20. presentation must be made.



Now the same 20 conditions but in much more detail:

- 1. All expeditions must be by the participants' own physical effort**, without motorised or outside assistance. Motorised wheelchairs may be used where appropriate to the needs of the participant.
- 2. All expeditions must be unaccompanied and self-sufficient.**
  - a) The team must be unaccompanied, unguided and supervision must be carried out remotely.
  - b) As part of effective remote supervision, teams may be more closely supervised for parts of the expedition where specific hazardous areas are unavoidable. This supervision should be kept to an absolute minimum.
  - c) If a team does not possess the necessary physical, first aid and expedition skills required for an area, then they should not be in that area.
- 3. All expeditions must be supervised by an adult** who is able to accept responsibility for the safety of the team.

4. **The expedition must have an aim.**
5. **All participants must be properly equipped.**
6. **Participants must have completed the required training and practice expeditions.** The qualifying expedition must not be over the same route or in the immediate vicinity of routes used in practice expeditions.
7. **At least one practice expedition must be undertaken** at each level of the programme, in the same mode of travel in a similar environment to the qualifying expedition. For overseas assessed expeditions, at least one UK practice must have taken place in an appropriate environment.
8. **The team must plan and organise the expedition.** Multiple teams should not travel in convoy but have individual routes from campsite to campsite. Where this is absolutely unavoidable, at least 30 minutes must separate each team using the same route and they must operate as discrete teams.
9. **Assessment must be by an approved Accredited Assessor.**
10. **There must be between four and seven** in a team (eight for modes of travel which have tandem). Unless in the event of an emergency, the team must always keep together. Page 12 The DofE Expedition Guide
11. **All participants must be within the qualifying age** of the programme level. This is regardless of whether they are under assessment or not.
12. **Participants must be at the same level of assessment.** Participants should have a similar ability or level of experience and must make a full contribution to the team.
13. **The team must not include those who have completed the same or higher level** expedition. Participants should have a similar ability or level of experience and must make a full contribution to the team.
14. **Accommodation should be by camping.**
15. **The expedition must be of the correct duration.**
  - a) The expedition must be of the minimum number of days and nights and must include appropriate acclimatisation/final preparation time.
  - b) An acclimatisation day during an expedition due to extreme altitude may be included as long as the minimum hours of activity and journeying are still completed.



c) An additional acclimatisation/rest day may be included during an expedition but this will not count toward the expedition days.

**16. The expedition should normally take place between the end of March and the end of October.** The expedition must take place at an appropriate time of year for the expedition's location and aim and the enjoyment of the participants.

**17. The expedition should take place in the recommended environment.** The expedition should take place in an appropriate and challenging environment. At Silver and Gold levels this must be unfamiliar to the participants. Overseas expeditions should take place in an area appropriate to the level of the expedition.

**18. The expedition must meet the minimum hours of planned activity.**

a) Six hours at Bronze, seven hours at Silver and eight hours at Gold. At least half of these daily hours must be spent travelling.

b) Time associated with overnight accommodation and catering is additional to the minimum daytime hours of planned activity.

c) Reasonable time for lunch and other appropriate breaks can be included within the hours of planned activity.

**19. A substantial meal should be cooked** and eaten by participants each day. This is optional on the final day.

**20. A presentation must be prepared and delivered after the expedition.** The presentation or report, which may be in any format the participants or teams choose, must be related to the expedition's aim.

### **3. Taking Ownership**

An essential element to all of the scouting expeditions is you, the person making the expedition, 'taking ownership' of it.

That is, owning all elements of the expedition. Including defining the purpose, planning, sorting out logistics, completing the expedition itself and presenting their findings.

If something goes wrong, it is their responsibility and generally not the adults.

This ownership concept cannot be emphasised enough. Adult leaders should constantly remind themselves of it. Although adults put a lot of work into making the entire programme happen, they should always take one step back. It is the youth's expedition and not the adults !



#### 4. Defining Expedition Purpose, Collecting Data & Presenting

A Hike without a purpose is just a Hike.

A Hike + Purpose = An EXPEDITION !

For DofE and any proper expedition, the most important and first task is deciding what your expedition purpose will be.

Examples of Scouting Expedition Purposes:

- Taking water samples – collect them in individual sample pots . Labelled with date, time, exact location. Send them to a lab to be analysed. Perhaps your local water authority might be able to help you with this.
- Taking soil samples . Again using individual sample pots. Again send them to a lab to be analysed.
- Recording condition of styles (steps over fences) and public foot path gates. This data could be sent to the local council.
- Record soil erosion. Send the data to the council for them to record the damage.
- Record information based on the project title ‘impact of man’ on the environment
- Testing new different types of expedition equipment

As an exercise, create a list of expedition purposes or projects.

Presenting your findings

Do not think you have to present your findings in in front of large audience, with Power-point or as an essay.

Your ‘project’ might be to write a play influenced by your hike in remote countryside.

It could be presented to a single person on how different types of equipment work on expedition.

There are endless ways on which project to select and how to present it.

#### **Top Tip:**

**MOST PROJECTS INVOLVE WRITING SOMETHING DOWN WHILST OUT ON THE EXPEDITION. PENCILS AND PENS DO NOT WORK WELL IN THE RAIN. CONSIDER USING A CHINAGRAPH PENCIL AS THIS WRITES ON ANYTHING !**

## **5. Planning of your Expedition**

In this section we will discuss:

- High level expedition planning
- Detailed planning of an expedition

Your expedition needs to be planned by yourselves.

You need to think what needs to be done and when.

As an exercise, list some high level activities that should occur before, during and after an expedition to make it a success.



### **5.1 Tasks in planning an expedition**

#### **High Level tasks for an Expedition**

1. Basics /Inception (coming up with the idea)
2. Training (theory & practice)
3. Planning the expedition itself
  - 3.1 where to do it
  - 3.2 adult support
  - 3.3 how much will it cost
  - 3.4 when to do it
  - 3.5 getting there and back
  - 3.6 how to collect project data
4. Qualifying Venture
5. Post expedition presentation

Now if we add all the details to this we get something like:

#### **STAGE 1: BASICS/INCEPTION**

- Identify Exped Youth Team members
- Identify Tutor / Adult Leader
- Decide Purpose
- Decide Rough Area / Location for Expedition
- Decide Rough Dates
- Rough Estimate on costs
- OBTAIN 'SIGN OFF' FROM ADULT LEADER TO PROCEED

#### **STAGE 2: TRAINING / PRACTICE HIKES**

- Decide project purpose
  - identify any specialised research required

Complete formal training

First Aid and Emergency Procedures  
Awareness of Risk and Health and Safety Issues  
Navigation and Route Planning  
Preparatory Map Skills  
Practical Map Skills  
Compass Skills  
Camp Craft Equipment and Hygiene  
Food and Cooking  
Country, Highway and Water Sports Codes  
Observation Recording and Presentations  
Team-building  
Proficiency in the Mode of Travel

Practice Hike 1 (Suggest one day, small day pack)

Practice Purpose

Plan/ execute practice Hike

Lessons Learnt/ Review Kit & Food

Practice Hike 2 (½ day hike, overnight camp, ½ day hike with full loaded rucksack)

Practice Purpose

Plan/ execute practice Hike

Lessons Learnt/ Review Kit & Food

OBTAIN 'SIGN OFF' FROM ADULT LEADER TO PROCEED

### **STAGE 3: EXPEDITION PLANNING**

#### STAFFING

Identify/ Confirm Adult Supervisor

Identify/ Confirm Adult Assessor

#### DATES

Provide 3 dates for assessor & supervisor for VENTURE  
& dates of PRE-EXPEDITION CHECK

Obtain Suitable dates back from Assessor/ Supervisor

#### CAMP SITES

Confirm availability of Camp sites

Book all camp sites

Send off cheques

Receive back booking confirmation

#### TRANSPORT

Work out high-level transport to/from area

Book/ arrange all transport

#### COSTS

Work out final costs

#### ROUTES

Create Draft Route (pc maps/ drawn on acetate)  
Confirm route meets DofE'20 points' check  
Produce Draft Routes for Adult Leader/ Supervisor  
Address any comments on routes from Supervisor

Produce Revised Route Pack for Assessor  
Address any comments on routes from Assessor

Produce Final Route packs (maps & Route cards)  
'LOCK DOWN' ROUTE PACKS - no more changes  
Deliver Route Pack to Supervisor  
Deliver Route Pack to Assessor  
Produce packs for each exped participant  
Ask Assessor for 'INITIAL CONTACT' with Supervisor

'FIRST CONTACT': Supervisor meets Assessor

#### IDENTIFY RISKS

#### MEDICAL & PARENTAL CONSENT

Issue Parental Permission Forms  
Collect in 'signed off' parental consent forms

Expedition 20 Point Rule Check (as listed in section 2 of this guide)

#### (ONE WEEK BEFORE EXPED):

Purchase Food  
Pre-Expedition Check By ASSESSOR (STEP 3)  
Pack rucksacks  
'Lock down' rucksacks  
Collect 'signed off' parental consent forms  
Take Picture of group in clothing to assist potential rescuers (emergency services)

OBTAIN 'SIGN OFF' FROM ADULT LEADER TO  
PROCEED

#### STAGE 4: THE QUALIFYING VENTURE

FIRST MEETING: Assessor meets Youth Team  
in Exped Area  
Carry out the Expedition (Bronze)  
Assessor meets team during trip  
Assessor debriefs team at end of expedition

#### STAGE 5: POST EXPEDITION

Identify lessons Learnt  
Feedback from Assessor



Prepare Presentation

## **5.2 Planned Travel / Project Time**

When planning your routes you should plan a certain amount of hours of activity.  
For Bronze/(maybe first class hike??)

For DofE Bronze/ First Class Hike it is 6 hours (say 5.5 hrs allowing for breaks)

For DofE Silver it is 7 hours (say 6.5 hrs allowing for breaks)

For DofE Gold it is 8 hours. (say 7 to 7.5 hrs allowing for breaks)

You can deduct from this your break times from your project times.

Therefore how many km can you walk in the time left?

I find that a youth group, with a fully loaded rucksacks tend to walk at 2.5 km/hr.

If carrying just a day pack then they will walk at 4km /hr.

Therefore for expedition, Silver 6.5hrs x 2.5km = 16.25km

Gold, 7.5 x 2.5km/hr = 18-19 km per day.

**These distances are on the basis that there is no real time consuming project !**

A project can take up to 50% of the project time. So if you are making loads of sketches of landscapes, your hiking/travel time could reduce from (for Gold) from 7.5 to around 3.5 !

The project element is very important.

## **6. Teams, Effective Teams and Your Natural Skill Set**

References: Belben – I cannot remember where I obtained this from. I have had it for at last 10 years so probably from project management course notes.

This could be a very valuable section to you now and in the future.

In this section we will discuss:

- What is a team
- Examples of teams
- A Team v's an Effective team
- Why teams succeed
- Why teams fail
- Roles in teams
- Specific roles in Expedition teams
- Belbin Roles/Personality Analysis



## **6.1 Defining a team and provide some examples**

A Team is a 'Group formed for an activity'. Therefore there are many 'Teams' around us in everyday life. For Examples, A Football team, A Rugby team

However, there are some not so obvious teams:

- A Family
- A Church
- A school
- A Community
- A scout group

Can you think of the main 'Roles' or jobs individuals take on in these examples?

## **6.2 Why some teams are effective and some fail**

Teams generally succeed when:

- Each team member is doing what they are good at
- Everyone trusts their team members
- Aims/ objectives are clear & understood by everyone

Therefore they can fail when:

- Team members are NOT doing what they are good at
- Members do NOT Trust their team members
- Aims/ objectives are NOT clear & understood by everyone
- Perhaps external pressure is too much to manage
- Personality clashes within the team
- Poor communication within the team

...I am sure you can come up with other reasons

## **6.3 Roles in teams**

Let us now examine in more detail an example mentioned previously: 'A family'. In this team you will need:



- Someone to get money in (Perhaps they work or get social benefits)
- Someone to run the budget and pay the bills (gas, electricity, food, holidays, birthdays)
- Someone to clean clothes and the house
- Someone to food shop, cook and wash up
- Someone to fix the vacuum cleaner when it is blocked
- Someone to change the light bulbs when they blow
- Someone to tidy the garden

- Someone to put the bins out

If all of these tasks are done by your mum then something needs to change !

Now the question is who/ what is the most important 'Role' in the above list ?

If one of these roles is missing, then the whole thing may start to fail.



**A TEAM IS NOT JUST A LEADER AND LOTS OF FOLLOWERS. EVERYONE HAS QUALITIES THAT CAN CONTRIBUTE TO AN EFFECTIVE TEAM.**

**Every role is important – we need to try have all the roles in place.**

Exercise: THE GREAT PLATE GAME

For this you will need a paper plate, string & several ping pong balls.

Now in your age groups, get yourself into an Team of 4.

The paper plate represents an expedition. It needs to be suspended between 4 strings. One string attached at 0, 90, 180, 270 degrees. Or 3,6,9, 12 o'clock

The ping-pong balls represent things you may get out of the expedition. Write each of the following on their own pin pong ball.

- achievement
- sense of self-reliance
- fun
- comradeship
- adventure

Place all the ping-pong balls in the plate and get 4 people to hold a string each. You need to lift the plate and balls by just using the strings around an obstacle course.

If you loose a ball then you have lost something out of the expedition.

It is very difficult – do you agree.? The paper plate bends and things fall off. You have to work carefully together to make this work.

Lets look specifically at your expedition teams:

What Expedition 'Roles' might you desire in a DofE/ Discovery Award/ First Class Hike Expedition Team ?

Here are some suggestions:

**The Researcher** – finds out time of trains/ buses, investigates details for a project

**The Navigator** – has a natural ability to know where they are on a map

**The Physical Motivator** – gets you going when you are not feeling like it

**The Time Keeper** – keeps you on schedule

**The Carer** – gives you the words of comfort when you are hungry, cold or lost.

**The Physical** - carries more in their rucksack as they are bigger and fitter than the others.

**The Decision maker** – is prepared to quickly identify the facts and influences the team into a quick decision

**The Mental Motivator** – gets into your head and mentally encourages you to get to the next check point.

**The Kit Checker** – looks around to make sure everyone has their share of kit and it works.

**The Sweeper** - checks the ground after starting again from a 10 min break. Waits until everyone is up and 5 metres away to check nothing is left behind.

**The Fixer** – who will fix the strap clip that broke 5km in to a hike.

**The Ideas person** – who comes up with the great project idea (but only one of ten ideas are sensible & achievable)

**The ideas shaper** – the one who takes the project idea and works out how you can do it.

...and I am sure we could go on and on with this list.

**NOTE WE HAVE NOT IDENTIFIED A 'LEADER' IN THE ABOVE LIST.**

For a youth expedition, you are all working as one unit. There should not be a specific leader.

**Most people could be trained to do all of these roles but if they have a natural ability at the task they will generally do it better.**

So the next question is which roles are you naturally suited to?

Some of these roles require an extrovert personality whilst others are the opposite.

There are lots of established systems from psychologists (mostly American) out there that have made a fortune dreaming up and selling the idea that we all fit into one of these team roles.

It is how we are wired. We can do nothing about it. You can sit in other roles but you probably will not enjoy it and therefore will probably not excel at it. We might naturally change 'roles' over time but generally we stay the same.

One of the well established systems is called 'Belbin Analysis'. This uses a series of very simple scenarios and offers multiple choice to how you would react. An example might be:

**I gain satisfaction when faced with an unexpected large problem whilst on expedition because:**

- a) I enjoy analysing situations and weighing up all the possible choices
- b) I am interested in finding practical solutions to problems
- c) I like to feel I am fostering good working relationships
- d) I can have a strong influence on decisions
- e) I can get a chance to see what new people have to offer
- f) I can get people to agree on a necessary course of action
- g) I feel in my element where I can give a task my full attention
- h) I like to find a field that stretches my imagination

There might be 8 such scenarios and you have to answer honestly. Your score is then added up and and you can see which one (or several) Belbin Role you fit into.

We do not want to go too much into team analysis but as it was mentioned, we now list the established 'Belbin Roles' characteristics:

**Not sure if this perhaps a bit 'over the top' but I now list all the Belbin roles and their features/ flaws.**

**Top Tip:**

**THE MOST IMPORTANT THING HERE IS TO WORK OUT WHAT YOU STRUGGLE WITH, IDENTIFY THAT TALENT IN SOMEONE ELSE AND TEAM UP WITH THEM !**

## **Completer-finisher (CF)**

### **Characteristics**

- Painstaking, orderly, conscientious.
- Great capacity for follow-through and detail.
- Unlikely to start anything they cannot finish.
- Motivated by internal anxiety but may appear unruffled.
- Typically introverted, need little in terms of external stimuli or incentives.
- Show self-control and strength of character.

### **Favourite phrases**

- There is no excuse for not being perfect.
- Has it been checked?

### **Contributions to the team**

- Protect team from mistakes and errors.
- Instill a sense of urgency and ensure high standards are met.
- Tendency towards perfectionism that is often valuable.

### **Tolerable Weaknesses**

- Tend to worry about small things.
- Reluctance to delegate, preferring to tackle tasks themselves.
- Intolerant of those with casual dispositions.

### **Unacceptable weaknesses**

- Obsessional behaviour.

## **Co-ordinator (CO)**

### **Characteristics**

- Calm, self-confident and controlled.
- Mature, trusting and confident.
- Delegate readily.
- Broad and worldly outlook, generally command respect.
- Strong ability to gain other people's confidence.
- Capacity for easily communicating with others.

### **Favourite phrases**

- Has anyone else got anything to add?
- We like to reach a consensus before we move forward.

### **Contributions to the team**

- Help the group make the best use of its resources, by recognising strengths and weaknesses.
- Ensure that each group member's potential is used.
- Calm approach to problems.

### **Tolerable Weaknesses**

- May build up own empires.
- Can be seen as manipulative.
- Off-loads personal work.
- Not get intensely involved with colleague on a personal level.

### **Unacceptable weaknesses**

- Taking credit for the team effort.

## **Monitor-evaluator (ME)**

### **Characteristics**

- Good critical thinking ability.
- Sober, unemotional, prudent.
- Has an objective approach.
- Good capacity for shrewd judgements that takes all factors into account.
- A good ME is seldom wrong.

### **Favourite phrases**

- Have we exhausted all the options?
- Better to make the right decision slowly than the wrong decision quickly.

### **Contributions to the team**

- Assist the group to take balanced decisions by analysing problems, evaluating ideas and suggestions objectively.
- Take critical decisions in an analytic, well considered manner.

### **Tolerable weaknesses**

- May be over-critical.
- May lack ability to motivate and inspire others.
- Over-serious.
- Scepticism with logic.

### **Unacceptable weaknesses**

- Cynicism without logic.

## **Resource-investigator (RI)**

### **Characteristics**

- Outgoing and enthusiastic.
- Inquisitive and communicative, with a readiness to see new possibilities.
- Relaxed personalities, with a capacity for contacting people and exploring anything new.
- Able to respond to a challenge.

### **Favourite phrases**

- Ideas should be stolen with pride.
- Never reinvent the wheel.

### **Contributions to the team**

- Explore and report on ideas, developments and other resources from outside the group.
- Create and maintain external contacts that may be useful to the group.
- Negotiation with outside contacts.

### **Tolerable weaknesses**

- Quickly bored.
- Variable in their diligence.
- Talkative.

### **Unacceptable weaknesses**

- Letting clients down by not making follow-up arrangements.

## **Shaper (SH)**

### **Characteristics**

- Highly strung, outgoing and dynamic.
- Great need for achievement, and strong drive.
- Like to lead others and push into action.
- Headstrong and assertive.
- Most competitive team role.
- Goal and achievement orientated.

### **Favourite phrases**

- I'd like it done by yesterday.
- When the going gets tough, the tough get going.

### **Contributions to the team**

- Direct group's behaviour, guarantee positive group action.
- Useful in teams where political complications may slow things down.
- Challenge ineffectiveness, complacency or self deception.
- Well suited to making necessary changes and does not mind making unpopular decisions.

### **Tolerable weaknesses**

- Prone to irritation and frustration.
- May be uncomfortable with committees or project groups.
- Single-minded and argumentative.
- May lack interpersonal understanding.

### **Unacceptable weaknesses**

- Inability to recover situation with good humour or apology (sore loser)

## **Implementer (IMP)**

### **Characteristics**

- Conservative, dutiful and predictable.
- Disciplined, reliable and efficient.
- Possesses realism and practical common sense.
- Subordinate personal goals to those of the team.
- Approach problems in a systematic fashion.

### **Favourite phrases**

- If it can be done, we will do it.
- To err is human, to forgive not human policy.

### **Contributions to the organisation**

- Turns concepts and plans into practical working procedures.
- Carry out plans systematically and efficiently.
- Reliable, will even do unpopular unpleasant tasks if necessary.
- Interest in company over-rides self-interest.

### **Tolerable weaknesses**

- May lack flexibility.
- Often unresponsive to new ideas that are not yet proved to be effective.
- Not spontaneous.

### **Unacceptable weaknesses**

- Obstructing change

## **Teamworker (TW)**

### **Characteristics**

- Sociable, mild and adaptable.
- Concerned about others.
- Perceptive and diplomatic.
- Good listeners, are generally popular members of a group.

### **Favourite phrases**

- If it's all right with you, it's all right with me.
- I was very interested in your point of view.

### **Contributions to the organisation**

- Smooth interpersonal problems and friction, thereby facilitating effective teamwork and team action.
- Help ensure that all team members get involved in team decisions and actions.
- Help maintain a high level of morale in the team.

### **Tolerable weaknesses**

- Indecision on crucial issues.
- Distaste for friction and competition.

### **Unacceptable weaknesses**

- Avoiding situations that may entail pressure.
- Tend to be introverted and react strongly to criticism and praise.

- Ideas may often be impractical and unorthodox.
- Independent, clever and original.

### **Favourite phrases**

- Ideas start with dreaming.
- The greater the problem, the greater the challenge.

### **Contributions to the organisation**

- Thinking up new ideas.
- Look for ways to solve difficult problems confronting the team.
- Make important contributions at the planning stage of a project.
- Contribute good ideas to get a stagnating project off the ground again.

### **Tolerable weaknesses**

- Can be impractical.
- Poor at communication with those on a different wavelength.
- Pre-occupation with ideas and neglect of practical matters.

### **Unacceptable weaknesses**

- Strong ownership of ideas when sharing it with others would provide better outcome.
- Typically creative, individualistic, serious minded and unorthodox.
- Prefer to operate by themselves.
- Ideas may often be impractical and unorthodox.
- Independent, clever and original.

## **Plant (PL)**

### **Characteristics**

- Typically creative, individualistic, serious minded and unorthodox.
- Prefer to operate by themselves.
- Tend to be introverted and react strongly to criticism and praise.

## **Specialist (SP)**

- **VERY RARE AND YOU ARE PROBABLY NOT ONE !!!!**

### **Characteristics**

- Dedicated to own field of expertise and knowledge.
- Concerned with maintaining professional standards and furthering and defending their own field.
- Goal directed.
- Technically skilful.

### **Favourite phrases**

- My subject is fascinating to me.
- True professionalism is its own reward.

### **Contributions to the team**

- Provide information of a technical or professional nature, which is often in short supply.
- Are valuable when good decisions depend on thorough detailed knowledge.

### **Tolerable Weaknesses**

- Contribute on only a narrow front.
- Dwell on technicalities.
- Not interested in other people's disciplines.

### **Unacceptable weaknesses**

- Ignoring factors outside own area of competence.

## **7. Decision Making and Problem Solving**

In this section we will cover:

- which decisions you make daily
- examples of problems on expeditions
- principles for making decisions

This section is just to give you an opportunity to think about problem solving with real examples you might face before, during and after an expedition.

Although these decisions/ problems during the expedition may be a struggle at the time, they can end up being the main memories afterwards. The real trick is to use them as learning opportunities. They can also be a great opportunity for your team to really work as a team.



### 7.1 Examples of problems you might come across:

Problem to solve/ Decision to make:	Discuss Possible Solution	Discuss Importance:
4 weeks before expedition. Not enough money to pay for it.		
Transport problems in getting to expedition area		
Losing kit on 2 <sup>nd</sup> day of expedition		
Route blocked e.g. flooding, unsuitable etc		
Sudden change in weather conditions before expedition.		
Sudden change in weather conditions during expedition.		
Member of expedition team becomes ill / injured and means you do not have enough to make a valid dofe team.		
Foot path closed (for example; due to cattle disease – Foot and Mouth)		
Should I take a jumper ?		
Should I get up extra early to start my expedition ?		
What food should I take?		
My mate is in another team. I do not know if I really want to mix with new people.		
My feet hurt.		
I have not packed enough food.		
I miss my mum. I want to talk to her. If I switch on my phone we may fail the expedition. What should I do?		

## General process to making Decisions

Here are some general suggestions to working through a problem or making a decision

- a) clarify problem – try not to be emotional about it
- b) identify influencing factors (time, cost, safety)
- c) consider the seriousness of the problem
- d) decide if one person is to make decision or should it be decided by the group.
- e) If there are too many options, try to eliminate some with a blunt simple rule.

- f) Suggest solutions – are they feasible
- g) REMEMBER THE BEST IDEAS COME FROM THE MOST IDEAS – DO NOT BE AFRAID TO SUGGEST ONE !
- h) CONSIDER ANY POSSIBLE AFTER EFFECTS !
- i) Make a decision, make a plan, inform the adult supervisors



- j) Stick to plan - but monitor progress and do not be afraid to change decision later (if you find out more facts)

## Outside influences

Are you in a fit state to make that decision at that time? – the effects being too hot/ too cold when trying to make a decision.

Think about making a decision under pressure (tired, rain, wind, hungry).

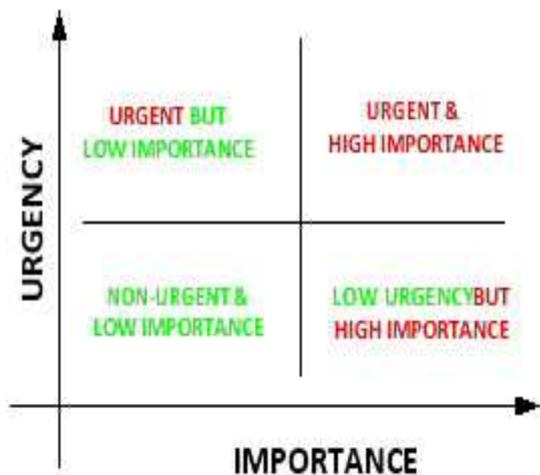
For example. It is 10am it is dry weather, sun, good visibility, you arrive at foot path half way up a mountain. You find that the path is closed due to land spill. You need to decide to turn back or risk going forward.

Now the same place, but 7pm with heavy rain. You are wet through, tired, hungry? Light is fading quickly..

Discuss both of these options.

## Balancing urgency with importance

It is important to balance the importance of the problem with its urgency.



Does that decision need to be made now?

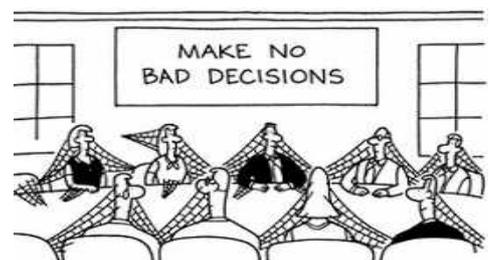
Discuss the following situations and place them in one of the 4 corners of the 'urgency v's importance' grid:

- 4 months from expedition and you have not booked up any camp sites yet.
- 1 week from expedition and you have not booked any camp sites yet
- 3 months from expedition and you have not booked up any camp sites in a busy tourist area and at a busy time of year

Notice how in (c) you have now found out that it is a very popular tourist area. You need to make sure you have all as many facts available before being able to make the decision.

## Right v's Wrong Decision

Some Philosophers would say that there is no such thing as a 'right' or 'wrong' decision. There is just a 'decision'. Don't feel bad about it.



If someone had all the experiences you have had in your lifetime they would make the same decision.

So do not beat yourself up if that decision turns out to give you a different outcome to what you expected.

Finally:

TRY NOT BE AFRAID OF MAKING A DECISION

(From Air Cadet NCO Development Training PROBLEM SOLVING:)

## 7.1 INTRODUCTION

The appreciation of a simple problem and the planning of its solution is fairly straightforward. Usually the problem is obvious and easy to understand. This is usually referred to as a "hard" problem, not because it is difficult but because it has hard facts to define it. The opposite type of problem is called "soft" because there are no obvious facts and it is not clear what the problem is or what the solution is. Problem solving techniques can be used to solve complex problems whether they are hard or soft.

## 7.2 THE FOUR STAGES OF PROBLEM SOLVING

There are four phases to the problem solving process as shown in Figures 6.1. Each phase is described below, techniques that can be used in each phase are described later.

- Problem Analysis and Re-definition.

With complex problems it is not always obvious what the problem is. It is easy to start solving the symptoms of the problem rather than the problem itself. This phase of the process is designed to gather as much information as possible about the problem. The end result of this phase is a definition of the real problem that has to be solved.

- Idea Generation.

Once the problem is defined it is necessary to generate ideas for possible solutions. Ready-made solutions may exist or simple adaptations of existing solutions may be possible. However, complex problems sometimes need innovative solutions. The idea generation techniques are designed to produce many possible solutions to form the output from this phase.

- Idea Evaluation and Selection.

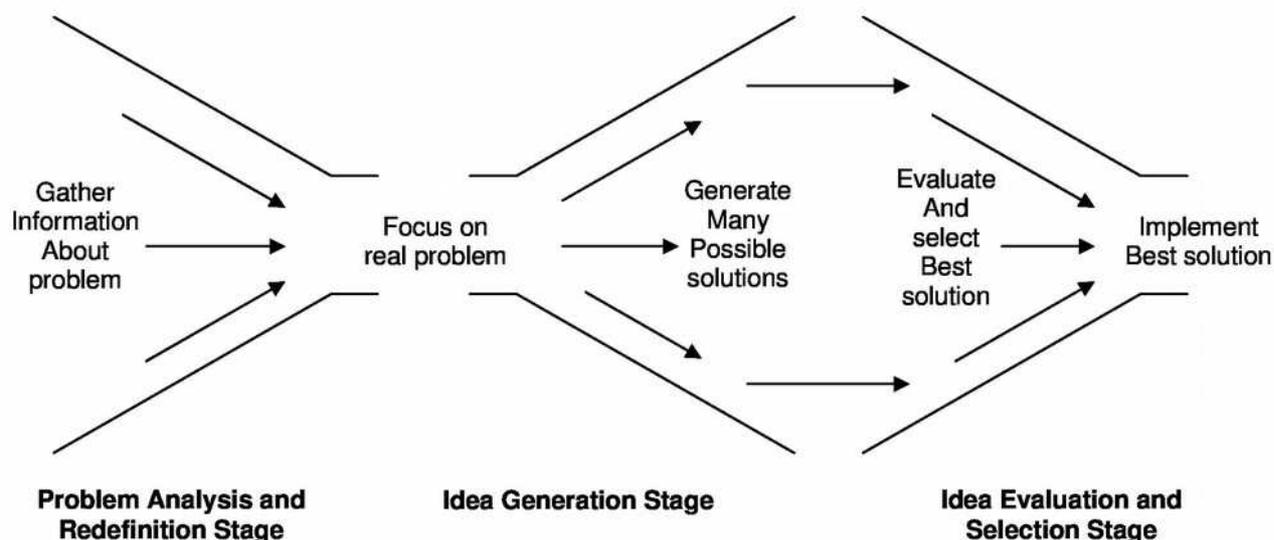
The problem with generating many ideas is that you then have to evaluate which is the best one and select the final solution.

- Implementation.

Having selected the best solution, the implementation phase is identical to the procedure described in "Getting Things Done". In summary make a detailed plan, brief the team, execute the plan and evaluate its success.

7.3 There are many hundreds of techniques that are: quick, long, easy, complex, for groups, for individuals, based on free association or forced relationships. The techniques described below are frequently used in problem solving and variations to each can be found.

Figure 7.1 - The Problem Solving Process



#### 7.4 TECHNIQUES FOR PROBLEM ANALYSIS

This phase needs to gather information about a given problem. A simple technique is described which can be used by an individual or as a team.

Five Ws and H. This is a variation on the Who, What, When, Where, Why and How, questions used by journalists to get all the information they need for a story. In the same way it can be used to gather information about a problem. There are five steps to the technique.

- State the problem using the expression "In what ways might..... ?"

An example might be: "we motivate scouts to attend more events?"

- Write down separate lists of Who? What? When? Where? Why? and How questions relevant to the problem as stated above. Examples of such questions might be:

- o Who doesn't attend all events
- o What events are least attended,
- o Where are the events held,
- o What makes cadets attend some events,
- o When do cadets attend events,
- o Why are some events unpopular,
- o How can we make all events popular.

- Write down responses to each of the above questions and examine them to see if it is possible to redefine the problem in some way. For example the answer to "When do cadets

attend events", might indicate that it is not the events that are the problem but the timing of when they are held.

- Select the new definition that best describes the real problem.

## 7.6 Deliberately left blank

## 7.6 TECHNIQUES OF IDEA GENERATION

Complex problems require lots of ideas to solve them. Generating ideas in a group sometimes leads to comments like "Don't be stupid" or "That will never work". This type of attitude prevents idea generation. Whatever technique is used the golden rules of idea generation are:

- **Defer Judgement.**  
That is don't criticise while ideas are being suggested, wait until the evaluation phase.
- **Quantity Breeds Quality.**  
If lots of ideas are generated then it is more likely that there will be some good ones amongst them.
- **Think Wild.**  
The wilder the idea the better, unusual ideas lead to breakthroughs away from normal solutions.
- **Combine and Improve Ideas.**  
Build on each other's ideas, ignore the fact that someone else thought of the basic idea first.
- **Take a Break.**  
Don't go on for too long, tiredness and boredom are not good for generating ideas.

## 7.7 Two techniques for generating ideas are described below:

- **Brainstorming.** Brainstorming is the simplest way of generating ideas. It relies on different people reacting to the ideas of others in different ways. The process requires a leader to control the group. The problem is stated and everyone is permitted to suggest a solution, usually in turn. The leader has to control the group firmly and a strict rule is that no one is allowed to criticise or make fun of any of the suggestions. The ideas are written down for evaluation later. It is sometimes a good idea to have more than one person taking down the ideas. To save time the leader might put a time limit on the process.
- **Reversals.** "Reversal" is a technique for looking at a problem from opposite points of view. For example solving a problem such as "How can we reduce the number of cadets leaving the Squadron?" might generate a few ideas. Reversing the problem to "How can we increase the number of cadets leaving the Squadron?" will probably generate many more ideas. The ideas are then reversed back to generate possible solutions. You may even find that the Squadron is already doing some of the things to drive cadets away!

## IDEA EVALUATION AND SELECTION

7.8 The selection of the best solution is not always easy, especially for soft problems.

There are several techniques that can be used individually or together to select the best solution.

- **Advantages/Disadvantages.** One simple method is to write down two columns stating the advantages and disadvantages of each solution. This works fine until some advantages and disadvantages are more important than others.
- **Scoring or Weighting System.** If some advantages are more critical than others then award each a number of points, the critical advantages getting the highest points. Do the same for disadvantages and then add up the two columns: The solution with the highest advantages score and lowest disadvantages score wins.
- **Culling System.** One way to select the best solution is to eliminate the poorest solutions and see what is left. This approach is called the culling system. The method involves writing down the pass/fail criteria for the best solution and then eliminating the solutions that don't meet the requirements. This technique is basically the one used when selecting a solution based on meeting all the essential requirements and all, or most, of the desirable requirements
- **Voting.** If the choice of the final solution rests with a group of people then a simple voting system can be used to select the solution. A two round system works best, the first round is used to eliminate the "no hopers" then the group votes again on the remaining options. If the scores are really close then it is possible to go to a third round.

## SUMMARY

7.9 Problem solving can be a complex process that can be performed by an individual or a team. When working as a team the important point is to remember that the individual wins only if the team wins. Try and put to one side any personal goals of wanting your idea to be chosen.

7.10 The four phases of problem solving can be summarised as:: focus on the definition of the problem, generate possible solutions to the problem, evaluate and select the best solution and then implement it.

## **8. Country Code, Moorland code, Road safety**

### **8.1 Country Code**

As an exercise, imagine your team represent the main bodies with an interest in the countryside.

Who are those groups?

Walkers/ ramblers  
farmers  
government  
'eco' groups  
scouting groups



Now , without referring to the countryside code (if you already know it), come up with a list of rules.

You will see that it will generally be the same as the countryside code.

-----  
The Countryside Code and its companion the Moorland Visitors' Code replaced the former Country Code in July 2004. Both Codes are sponsored by the Countryside Agency.

The new Code is designed to reassure land managers as new public rights of access begin, and to make the public aware of their new rights and responsibilities across the whole countryside.

There are five headings common to both codes, and a sixth relating to Moorland. The main points on each heading are as follows.

-----  
Be Safe - Plan Ahead and Follow Any Signs

Refer to up-to-date maps or guidebooks.

You're responsible for your own safety and for others in your care, so be prepared for changes in weather and other events.

Check weather forecasts before you leave, and do not be afraid to turn back, it shows good leadership qualities to do this and to know the limitations of your party.

Part of the appeal of the countryside is that you can get away from it all. You may not see anyone for hours and there are many places without clear mobile-phone signals, so let someone else know where you are going and when you expect to return.

Leave Gates and Property as You Find Them

Please respect the working life of the countryside, as our actions can affect people's livelihoods, our heritage, and the safety and welfare of animals and ourselves.

A farmer will normally leave a gate closed to keep livestock in, but may sometimes leave it open so they can reach food and water.

Leave gates as you find them or follow instructions on signs; if walking in a group, make sure the last person knows how to leave the gates.

Follow paths across land that has crops growing on it, wherever possible.

Use gates and stiles wherever possible - climbing over walls, hedges, gates and fences can damage them and increase the risk of farm animals escaping.



Our heritage belongs to all of us - be careful not to disturb ruins and historic sites. Leave machinery and livestock alone - do not interfere with animals even if you think they are in distress. Try to alert the farmer instead.

#### Protect Plants and Animals, and Take Your Litter Home

We have a responsibility to protect our countryside now and for future generations, so make sure you do not harm animals, birds, plants or trees. Litter and leftover food does not just spoil the beauty of the countryside, it can be dangerous to wildlife and farm animals and can spread disease - so take your litter home with you. Dropping litter and dumping rubbish are criminal offences.

Discover the beauty of the natural environment and take special care not to damage, destroy or remove features such as rocks, plants and trees. They provide homes and food for wildlife, and add to everybody's enjoyment of the countryside.



Wild animals and farm animals can behave unpredictably if you get too close, especially if they are with their young - so give them plenty of space. Fires can be as devastating to wildlife and habitats as they are to people and property - so be careful not to drop a match or smouldering cigarette at any time of the year. Sometimes, controlled fires are used to manage vegetation, particularly on heaths and moors between October and early April, so please check that a fire is not supervised before calling 999.

#### Keep Your Dog Under Close Control

The countryside is a great place to exercise dogs, but it is every owner's duty to make sure their dog is not a danger or nuisance to farm animals, wildlife or other people.

By law, you must control your dog so that it does not disturb or scare farm animals or wildlife. You must keep your dog on a short lead on most areas of open country and common land between 1 March and 31 July, and at all times near farm animals.

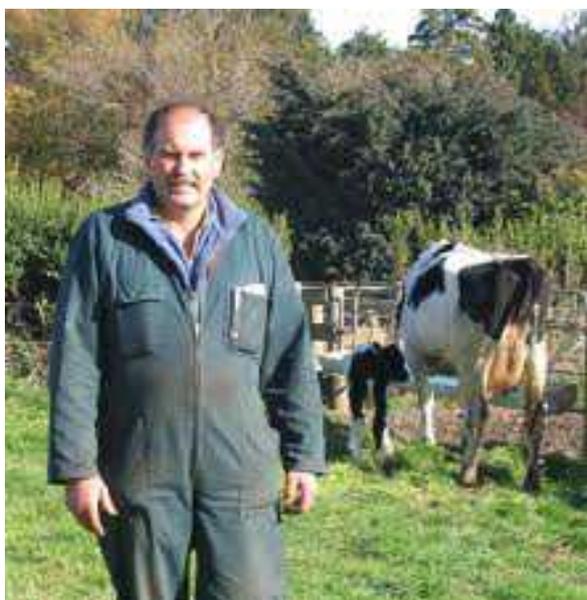
You do not have to put your dog on a lead on public paths as long as it is under close control. But as a general rule, keep your dog on a lead if you cannot rely on its obedience. By law, farmers are entitled to destroy a dog that injures or worries their animals.

If a farm animal chases you and your dog, it is safer to let your dog off the lead - don't risk getting hurt by trying to protect it.

Take particular care that your dog does not scare sheep and lambs or wander where it might disturb birds that nest on the ground and other wildlife - eggs and young will soon die without protection from their parents.

Everyone knows how unpleasant dog mess is and it can cause infections - so always clean up after your dog and get rid of the mess responsibly. Also, make sure your dog is wormed regularly. You can also find out more by phoning the Open Access Helpline on 0845 100 3298.

### Consider Other People



Showing consideration and respect for other people makes the countryside a pleasant environment for everyone - at home, at work and at leisure.

Busy traffic on small country roads can be unpleasant and dangerous to local people, visitors and wildlife - so slow down and, where possible, leave your vehicle at home, consider sharing lifts and use alternatives such as public transport or cycling. For public transport information, phone Traveline on 0870 608 2608.

Respect the needs of local people - for example, do not block gateways, driveways or other entry points with your vehicle.

By law, cyclists must give way to walkers and horse riders on bridleways.

Keep out of the way when farm animals are being gathered or moved and follow directions from the farmer. Support the rural economy - for example, buy your supplies from local shops.

## 8.2 The Moorland Visitor's Code



Although the Moorland code is very similar to the country code, I thought I would add here in its entirety to illustrate different 'codes' available.

Heather covered moorlands look stunning, especially in August and September when in full purple bloom and people are drawn to their great open landscapes. The 'Right of Access to Open Country'

welcomes walkers to 'mountain, moor, registered common land, heath and down' – and with our rights, come responsibilities – naturally.

Britain has 75% of the world's remaining heather, and it is these heather moorlands that provide some of the last safe havens for ground nesting birds such as curlew, lapwing, merlin, golden plover and black grouse. As a result, the law protects most of these moorlands.



Even though it may appear so, moorland is not wild and looks the way it does due to management – it is used to graze sheep and/or cattle and, where there is a predominance of heather, it is likely that the area is managed for red grouse. Moorland management for grouse shooting plays a big part in conserving one of the most important and unique habitats in Europe – for us all to enjoy. For these wildlife and management reasons, at times, some moorland areas will be subject to 'restrictions' such as keeping your dog on a short lead and following paths and tracks. Our moorlands are there for us to enjoy, and by being informed and responsible visitors, we can all play our part in conserving our unique heather heritage and its wildlife for future generations.

- [Be safe – plan ahead and follow any signs.](#)
- [Keep dogs under close control.](#)
- [Prevent uncontrolled moorland fires](#)
- [Protect plants and animals, and take your litter home.](#)
- [Leave gates and property as you find them.](#)
- [Consider other people.](#)

### **Be safe – plan ahead and follow any signs**

Even when going out locally, it's best to get the latest information about where and when you can go – especially if you are taking a dog (for example, your rights to enter some areas of open land may be restricted while work is carried out, for safety reasons or during breeding or shooting seasons). Follow advice and local signs, and be prepared for the unexpected.

- Refer to up-to-date maps or guidebooks, visit: [www.countrysideaccess.gov.uk](http://www.countrysideaccess.gov.uk), or contact local information centres.
- You're responsible for your own safety and for others in your care, so be prepared for changes in weather and other eventualities – consider taking extra clothing, a compass, water, food, a torch and personal medicines. See: [www.countrysideaccess.gov.uk](http://www.countrysideaccess.gov.uk) for links to organisations offering specific advice on equipment and safety, or contact visitor information centres and libraries for a list of outdoor recreation groups.
- Check weather forecasts before you leave and don't be afraid to turn back.
- Be aware that heather can be difficult to walk in and to look out for boggy areas, old mines and holes that can be hidden by the heather.
- Part of the appeal of the moors is that you can get away from it all. You may not see anyone for hours and there are many places without clear mobile phone signals – so let someone else know where you're going and when you expect to return.
- Get to know the signs and symbols used in the countryside to waymark paths and indicate open countryside below and at: [www.countrysideaccess.gov.uk](http://www.countrysideaccess.gov.uk)

	<b>Footpath Waymark</b>		<b>National Trails</b>
	<b>Bridleway Waymark</b>		<b>Open Access</b>
	<b>Byway Waymark</b>		<b>No Open Access</b>

### Keep dogs under close control

The countryside is a great place to exercise dogs, but it's every owner's duty to make sure their dog is not a danger or nuisance to farm animals, wildlife or other people. Internationally important birds such as curlew, lapwing, red grouse, merlin, golden plover and black grouse rely on moorland to breed and are vulnerable because they nest and live on the ground.



- By law you must control your dog so that it does not disturb or scare farm animals or wildlife. You must keep your dog on a short lead on most areas of open country and common land in the nesting and lambing season – during March, April, May, June and July – and at all times near farm animals.
- Dogs will be excluded from some areas of heather moorland all year round and other areas at certain times to protect wildlife. Please find out more about these rules from: [www.countrysideaccess.gov.uk](http://www.countrysideaccess.gov.uk) and obey local signs.
- From 1 March to 31 July take particular care that your dog doesn't scare sheep and lambs or wander where it might disturb birds that nest on the ground and other wildlife. Parent birds can

be frightened off their nests long enough to chill the eggs and kill the chicks inside. Hatched chicks can be scattered and unable to return to the parent for protection from predators and the cold.

- You do not have to put your dog on a lead on public paths, so long as it is under close control. But as a general rule, keep your dog on a lead if you cannot rely on its obedience. By law, farmers are entitled to destroy a dog that injures or worries their animals.
- If a farm animal chases you and your dog, it is safer to let your dog off the lead – don't risk getting hurt by trying to protect it.
- Everyone knows how unpleasant dog mess is and it can be the source of infections – so always clean up after your dog and get rid of the mess responsibly. Also ensure your dog is wormed regularly if you walk it in the countryside.

### Prevent Uncontrolled Moorland Fires

Smouldering cigarette ends, discarded bottles and dropped matches can all cause uncontrolled fires on moors – particularly during the spring and summer. Serious, deep-seated fires are fatal to important animals and plants and devastating to the landscape.



- Never light fires on moorland – not even gas stoves or barbecues.
- During periods of high fire risk respect all warning signs. Following severe wild fires, our unique moorlands can be left black, scarred, prone to erosion and devoid of wildlife for decades.



- However, carefully planned small-scale heather burning by trained gamekeepers is used to encourage fresh shoots of heather where it has grown old. This light, surface burning ensures food for red grouse and sheep and creates the diversity of habitats that moorland birds rely on. Between 1st October and 15th April controlled burning takes place – so be aware of this. Please report any fires seen on moorland outside these dates to the fire service immediately, and if possible, the nearest dwelling.

## Protect plants and animals, and take your litter home

We have a responsibility to protect our countryside now and for future generations, so make sure you don't harm animals, birds, plants, or trees.

-  Litter and leftover food doesn't just spoil the beauty of the countryside, it can be dangerous to wildlife and farm animals and can spread disease – so take your litter home with you. Dropping litter and dumping rubbish are criminal offences.



- Discover the beauty of the natural environment and take special care not to damage, destroy or remove features such as rocks, plants and trees. They provide homes and food for wildlife, and add to everybody's enjoyment of the countryside.
- Wild animals and farm animals can behave unpredictably if you get too close, especially if they're with their young – so give them plenty of space.
- If you disturb a bird from the ground in Spring and Summer, please re-trace your steps a few metres and give the area a five metre berth. This will reduce damage to eggs and chicks.

## Leave gates and property as you find them

Please respect the working life of the countryside, as our actions can affect people's livelihoods, our heritage, and the safety and welfare of animals and ourselves.

- A farmer will normally leave a gate closed to keep livestock in, but may sometimes leave it open so they can reach food and water. Leave gates as you find them or follow instructions on signs; if walking in a group, make sure the last person knows how to leave the gates.
- Use gates and stiles wherever possible – climbing over walls, hedges and fences can damage them and increase the risk of farm animals escaping.
- Leave machinery and livestock alone – don't interfere with animals even if you think they're in distress. Try to alert the farmer instead.
- When walking across land that has crops growing on it, follow paths wherever possible.
- Our heritage belongs to all of us – be careful not to disturb ruins and historic sites. The few structures that there are on moors such as 'sheep folds', 'handling pens' and 'grouse butts' are historic and today still serve a crucial purpose
- If you think a sign is illegal or misleading (for example, a 'Private – No Entry' sign on a public footpath), contact the local authority.

## Consider other people

Showing consideration and respect for other people makes the countryside a pleasant environment for everyone – at home, at work and at leisure. Moorlands managed for red grouse, farm stock and as water catchment areas, create year-round jobs for shepherds, water bailiffs, gamekeepers and moorland regeneration contractors – all of whom contribute to the conservation of moorland and its thriving wildlife.

- Moorland gamekeepers play a crucial role in the well being of the moors. Rats, foxes, stoats, weasels and crows prey on moorland birds and you may see predator traps or gamekeepers out with a firearm (sometimes at night too) – both are there to protect the birds. Remain alert and please appreciate that gamekeepers are doing their job.
- From 12th August to 10th December every year you may encounter shooting parties and red flags could signify areas that should not be entered, or there may be local signs or estate staff asking you to move to another area. Please respect these requests as they will only be short term.
- Large-scale machinery is rare on moors, but if you encounter it, it's likely that specialist heather re-seeding or 'grip blocking' is being carried out – this is environmentally beneficial. Similarly, spraying to remove harmful bracken swathes may also happen between mid-July and late-September, usually at times where there is little wind.
- Moorland streams are used by livestock and often feed reservoirs for town and city drinking supplies so be careful not to pollute them.
- Busy traffic on small country roads can be unpleasant and dangerous to local people, visitors and wildlife – so slow down, and where possible leave your vehicle at home, consider sharing lifts and use alternatives such as public transport or cycling (for public transport information contact Traveline: 0870 608 2608).
- Respect the needs of local people – for example, don't block gateways, driveways or other entry points with your vehicle.
- Keep out of the way when farm animals are being gathered or moved and follow directions from the farmer.
- When riding a bike or driving a vehicle, slow down for horses and walkers, or when passing livestock (by law, cyclists must give way to walkers and horse-riders on bridleways).
- Support the rural economy – for example, buy your supplies from local shops.

### **8.3 Country Road Safety**

- Always face oncoming traffic
  - Walk on the inside of a tight bend
  - Presume any vehicle is going too fast and will NOT see you
  - Wear High Viz at any time on a road when walking
  - keep in single file
- Never stop for a break on a road. Step into a field instead

### **9. Managing risk and keeping safe**



This does not mean how we stop you having fun or adventure. This is just about you being aware of what you are doing, what are the risks. It is also trying to encourage you to think about if it all went wrong – what would you do?

#### **What does 'Risk' and 'Safety' Mean?**

'possibility of loss, injury or damage'  
'a dangerous element or factor'

...and safety means making sure you do not get injured.

EXERCISE:

- identify hazards of different situations
  - walk in the woods,
  - walk down a dark alley etc

### What might happen on an expedition?

- Bee sting
- sprained ankle (trip or fall)
- broken leg (trip or fall)
- impaled on a tree branch (trip or fall)
- Losing a limb due to messing with farm machinery
- Hypothermia (too cold)

I am sure you could come up with loads more things that can go wrong.

### Why bother considering risk?

- you are still young and injuries now can stay with you all your life
- A small injury in a dangerous environment could lead to much more serious consequences. For instance, a sprained ankle on a Sunday afternoon small country walk is probably easy to manage. But what if it is in remote countryside with the weather changing for the worse?

### How can we mitigate against these risks? (To cause less harm. To reduce the risk)

- Expedition fitness.
- Telling people where you are going. – ROUTECARDS, camp wardens, home contact
- Identifying and avoiding hazards.
- Keeping together. - CRITICAL
- checking weather forecasts
- knowing how, where and when to obtain weather forecasts, relating weather forecasts to what you are see now, looking for signs which will indicate changes in the weather



## 10 Basic Navigation

References:

diagrams and material from various websites, Hill walking book by Stephen Long, Army Cadet Navigation Training, Ordnance Survey.

Technical skills:

- The Basic set of 1:25k Map symbols

**Top Tip:**  
**You can walk on any path on a map that is marked in Green (dots/dashes etc – foot paths, bridal ways, etc)**

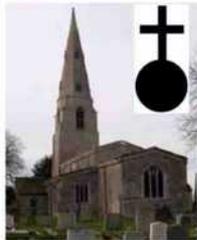
- Completed their 1<sup>st</sup> Class hike (or have had a similar experience)
- Basic knowledge of a base plate compass.
- Ability to walk to a bearing.
- Be able to estimate route distances on a 1:25k

### 10.1 Basic set of 1:25k Map symbols

All these signs are the basic set that are relevant for your first class hike / bronze DofE. You should definitely know these for Silver DofE and 90% of all OS signs for Gold DofE/ Discovery!



'Place of Worship'  
 Anywhere that is not a traditional church. So could be a community hall.



Church with a spire (i.e. conical or pyramid)



Church with a tower (i.e. square from above)



**Non-Coniferous Trees**  
 (Drop leaves in Autumn)



**Orchard** (For growing apples, pears etc)  
 Notice the 3 round bulbs



**Coniferous**  
 (Green all year round + don't drop leaves)

**Top Tip:**  
 Coniferous trees are often used as a wood crop. They can be all cut down just after OS have published a map of that area. Therefore that forest may be printed on your map but you cannot see it.

**Top Tip:**  
 Do not mistake an electric pylon cable route as a foot path. They are black NOT green !



Windmill



Motorway



Train Station (2 railway lines)



Wind Turbine



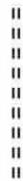
'B' Road



Train Tunnel



Steep/ high gradient road



Track



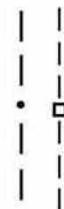
Road Over train line



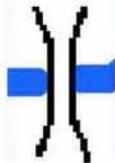
Train line (x2)



footpath



Pylon (small and major poles)



Bridge over water



Dual Carriageway



Transmitter



Level Crossing

## 10.2 The base plate compass

\*\*\*\*\*Add lensatic compass\*\*\*\*\*

A compass has 2 purposes:

- a) protractor (measures angles)
- b) points to magnetic north

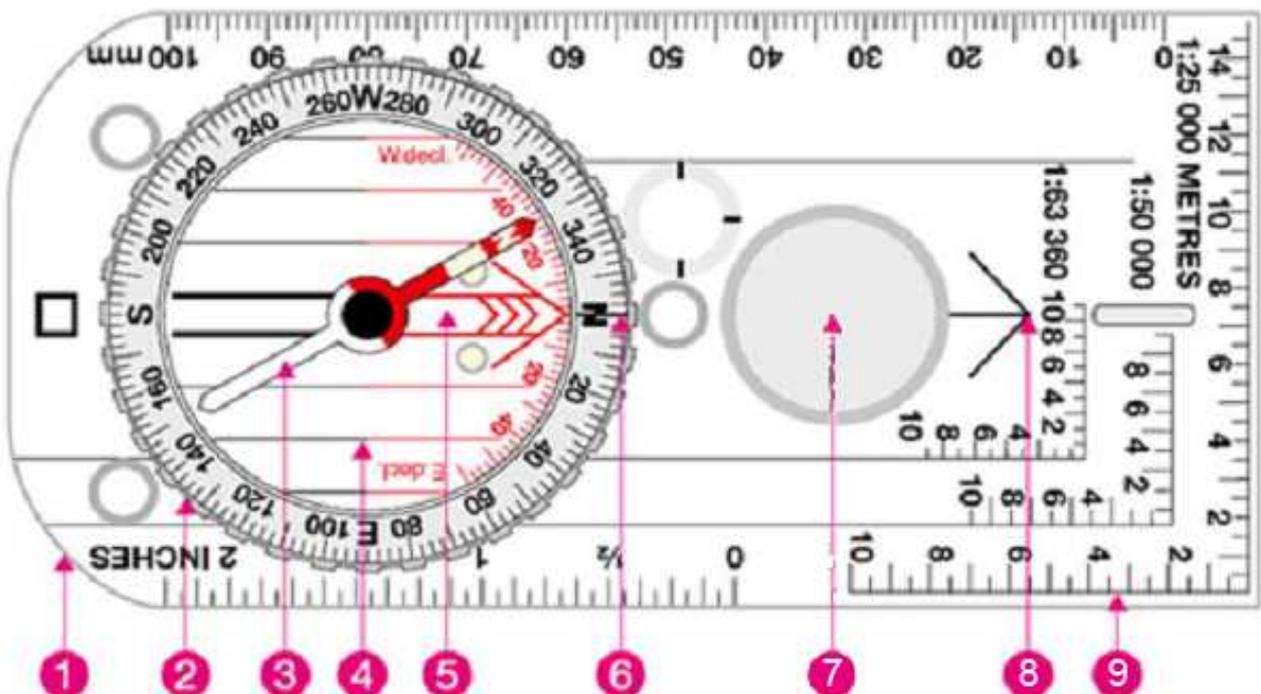
We use a combination of these 2 functions to navigate our way.

Swedish 'Silva produce good Expedition' 4 (with inbuilt magnifying glass and 1:25k romers scales around a corner). Beware American 'Silva' that are cheap copies of the Swedish originals.

### Parts of the compass are:

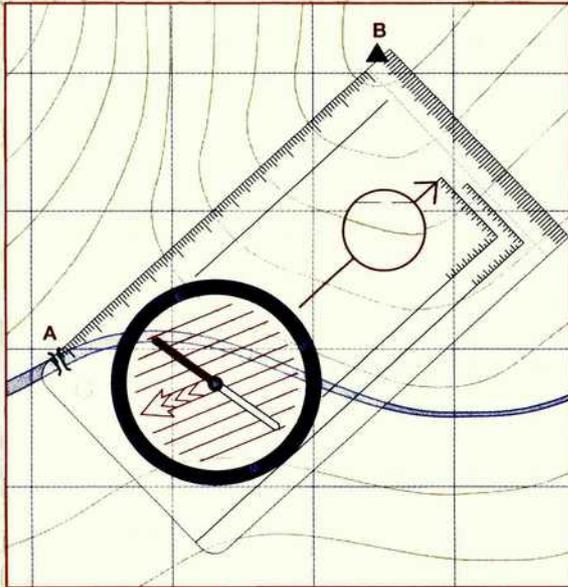
- 1) Base plate
- 2) Compass housing - also known as the compass wheel, with a mark every two degrees covering 360 degrees, and N-S-E-W (the 'cardinal points') marked (military compasses have 'mils' instead of degrees).
- 3) Magnetic needle - red end for north, white for south.
- 4) Orienteering lines - on the bottom of the rotating housing.
- 5) Orienting Arrow - rotates with the orienteering lines.
- 6) Direction of travel marker (on rotating housing – this mark does not rotate)
- 7) Magnifying glass – for small detail on the 1:25k maps
- 8) Direction of travel arrow - the big arrow at the end of the baseplate.
- 9) Romer scales 1:25 000, 1:50 000 and metric measurer

### Care when using a compass

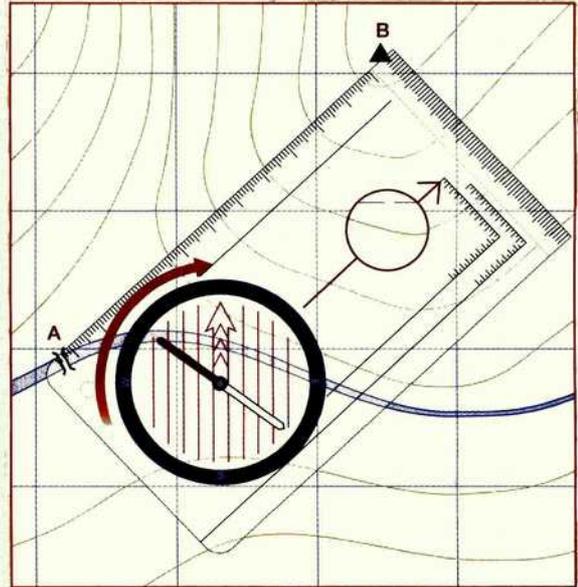


### 10.3 Using compass - map to 'real world'

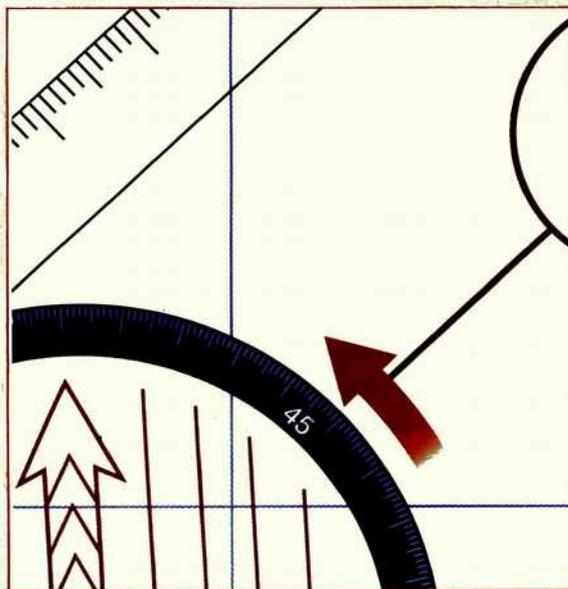
Going from a map to 'real world'



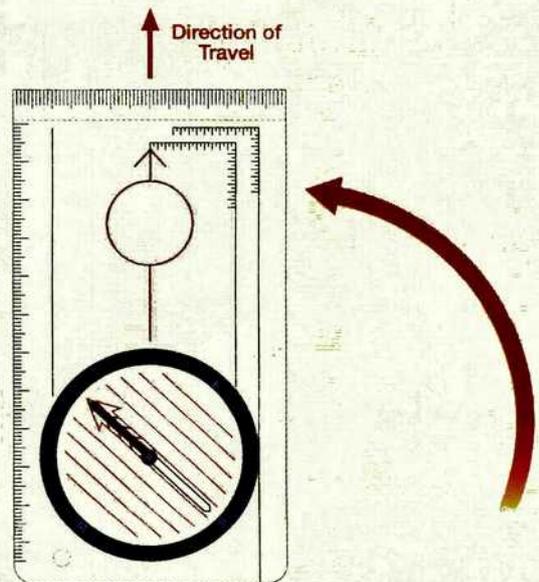
**A** Align the compass along the required route on map



**B** Rotate the compass housing to align the orienting lines with the north-south grid lines on the map



**C** Rotate the compass housing to compensate for magnetic variation



**D** Remove the compass from the map, rotate the compass so that north end of the needle and the orienting arrow are aligned and then proceed following the direction of travel arrow

When using a compass, keep it well clear of magnetic metallic objects like knives, belt buckles, cars, bolts in wooden benches, overhead power lines (magnetic fields) as this will affect the direction in which the compass points.

#### 10.4 Using compass - 'real world' to a map

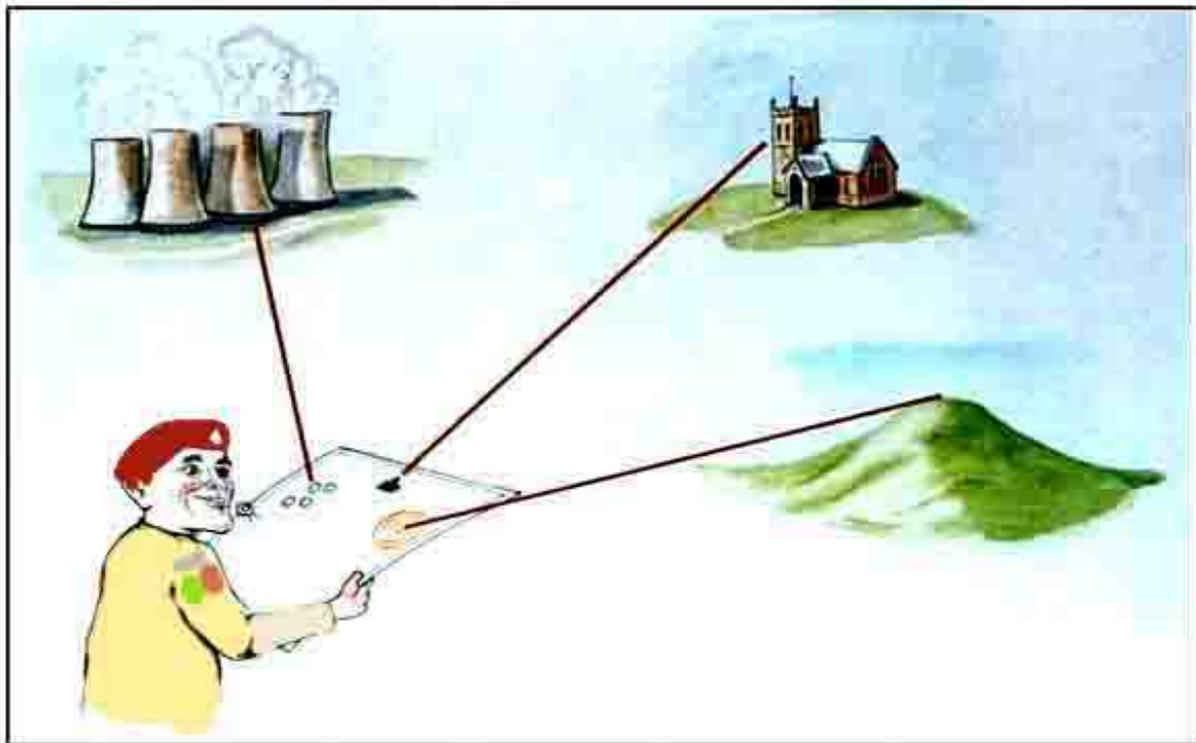
Same as last section but in reverse !

Note for the UK we normally add magnetic variance when going to real world and subtract it when going to map.

Refer to the separate section on 'magnetic variance' for more information on this tricky subject.

#### **Top Tip:**

**Old churches are generally aligned with the altar in the east. Therefore you can double check your direction and orientation.**



Using the map, observe the ground and orientate yourself using visible land marks or reference points.

#### 10.5 Setting a map

'roughly' set or orient the map, turn the map around until the North or top of the map is pointing towards the actual North, and so that the features on the map are shown in relation to their position on the ground. You can set the map by either using a compass or looking at features around you.

#### **Top Tip:**

**Once set, read the map as it is. Do not turn it around. Once you have developed this skill, it is much quicker to navigate and you will avoid silly mistakes.**

To set your map using the compass (accurate compared to rough above), line up the red arrow on the dial with the direction of travel arrow. Then place the compass on the map with the edge of the baseplate running along one of the blue gridlines, with the direction of travel arrow pointing to the top of the map.

**Now rotate the map until the red magnetic needle lines up with the red arrow on the dial . Now you know which way you are facing, the direction of North, and you can start to try and identify points on the ground from the map, or vice-versa.**

### **10.6 Estimate distances on a 1:25k map**

What does a 1:25k (or 1:25,000) map mean?

1cm on a paper map = 25,000 cm on the land.

Or 1cm on map = 250 metres on land

#### **Estimating on a 1:25k map**

A blue 4x4cm box on an OS paper map represents 1km wide x 1 km high. Or 1,000 metres x 1,000 metres.

For distance estimation, we need to know what is the distance of a diagonal line across the blue box?

Using Pythagoras Theorem  $a^2 = b^2 + c^2$

$$a^2 = 1^2 + 1^2 \text{ ('a' is the diagonal)}$$

Therefore  $a = \sqrt{2}$  ( square root of 2)

= 1.414km or approx 1.5km

Now you can quickly estimate distance north to south, east to west

and any diagonal line

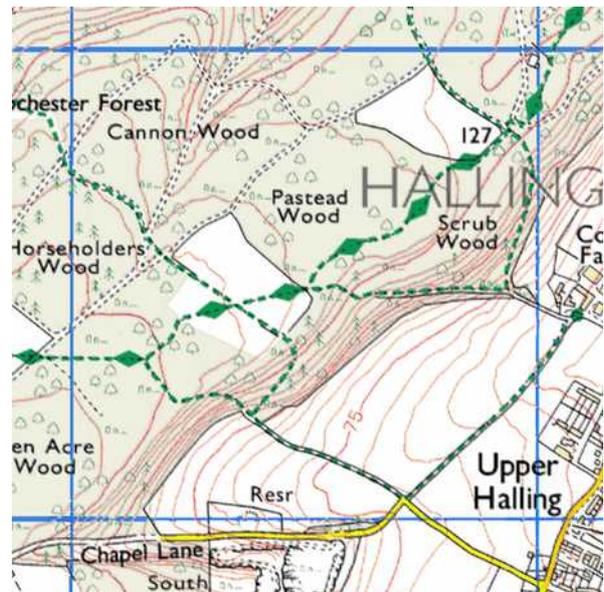
N/E to S/W & S/E to N/W.

### **10.7 Basic OS Grid References**

Map/grid references are usually given as 2 alpha and six-figure numbers. These represent the grid square, and a particular point within that square.

The alpha characters are in the 2 large blue letters in the top left hand corner of the paper map.

1:25k and 1:50k maps are divided into 1 km blue squares. The horizontal and vertical lines is identified by a two-figure number. These are written on the paper maps, on the lines at regular intervals. These give you the first of the numbers for the six-figure reference - two vertical numbers and two horizontal numbers.



**Top Tip:**  
**Way to remember how to give a grid reference: 'Along the corridor and up the stairs'**

The vertical lines are known as “Eastings”, for although they run, individually, up and down the map, they advance across the map from left to right, or heading from West to East - hence “Eastings”.

The same applies to the horizontal lines which advance in series up the map, from South to North, and are called “Northings”.

Where the two lines intersect you have a grid point, and you can express this by giving the numbers of the grid lines, first the easting and then the northing, for example the highlighted square containing the church will have the four figure reference 04 88. That defines a one kilometre square.

If you wanted to give the position of the church more accurately, find the point within the blue square then divide the “Easting” and “Northing” lines into ten imaginary lines. Pinpoint the spot by referring to the intersection of the imaginary lines which would cut it.

Number of Figures		Precision
0	<b>SP</b>	100 x 100 kilometres
2	<b>SP 8 5</b>	10 x 10 kilometres
4	<b>SP 82 52</b>	1 x 1 kilometre
6	<b>SP 825 525</b>	100 x 100 metres
8	<b>SP 8255 5255</b>	10 x 10 metres
10	<b>SP 82555 52555</b>	1 x 1 metre

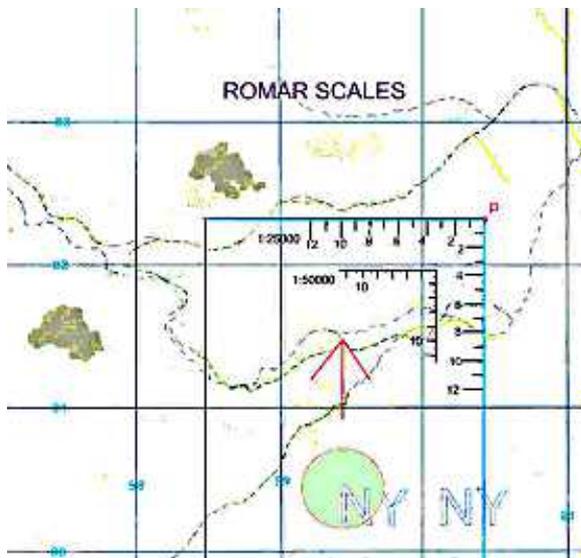
**10.8 How accurate is a grid reference?**

**10.9 How to Find an OS Grid Reference (using the romar)**

It appears it can be spelt ROMER or ROMAR.

Although far from essential, a compass with Romar scales is a convenient instrument to estimate the O.S. grid references. Both the 'Silva 54 combi' and the 'Silva expedition 54' have them.

On a 1:25,000 scale map the interval between lines representing 1 km are 4cm.



Using the Romar scale on the compass, splitting into hundredths is just possible, especially on the 1:25,000 scale map, as in the diagram below.

The diagram shows using a Romar scale to find a more accurate map reference.

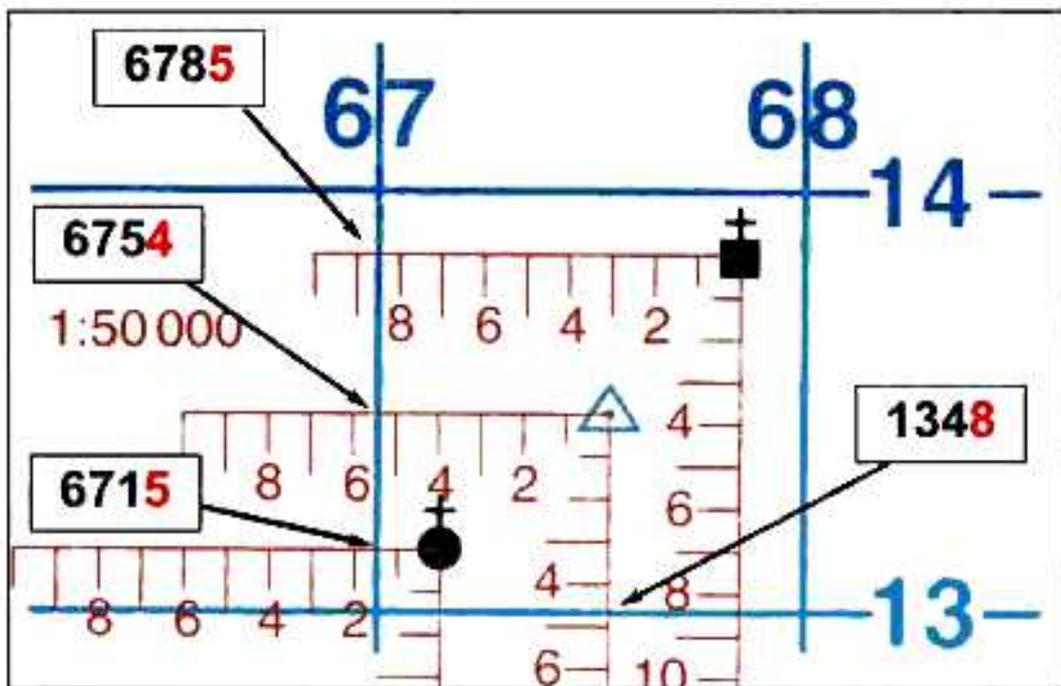
The Romar scale for the 1:25,000 scale map are the two sets of graduations at right angles on the outer edge of the baseplate of the compass. Place the junction of these graduations over the location on the map, whose grid reference is required, as shown in the diagram.

If the values are rounded to the nearest digit, then the 6 digit answer will be within  $\pm 50$  metres and the 8 digit answer will be within  $\pm 5$  metres.

The Romar scale for the 1:50,000 scale map is placed away from the edge of the baseplate and so one should try to look directly over the graduations to avoid parallax errors. Some compasses have baseplates with the Romar scale in one direction only (some recta compasses have this). This is not so convenient because the baseplate has to be turned through  $90^\circ$  between measurements.

To get this level of precision of 4 + 4 digits, you will need to look very carefully at the Romer scale. You will need good light, a steady hand and preferably not be in the middle of a storm on a moor.

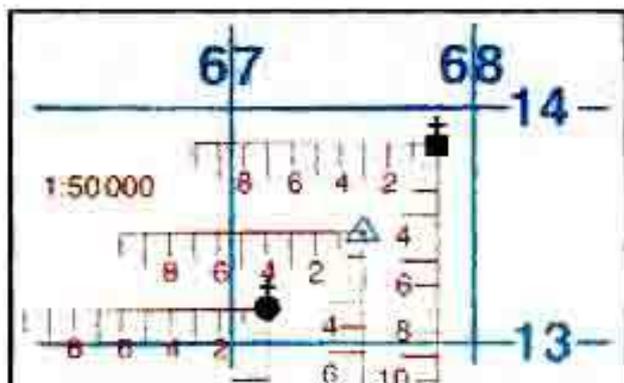
To improve accuracy when plotting grids a Romer will be a useful tool.



## Accuracy

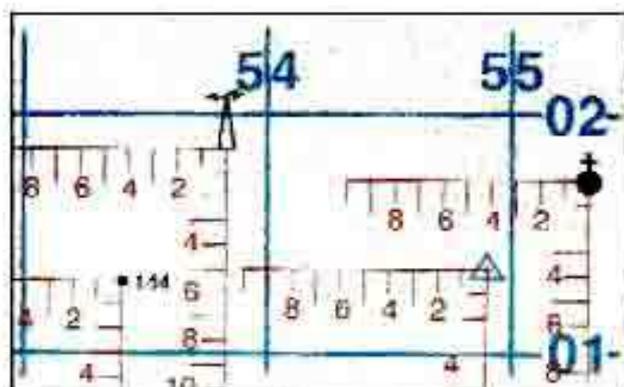
This is the limit of accuracy you should expect from your romers:

1:25000 - 8 Figure grid reference is accurate to 10m.



### EXAMPLE 1

GR 67851385	Church with tower.
GR 67551347	Trig Point.
GR 67151335	Church with spire.



### EXAMPLE 2

GR 55300173	Church with spire.
GR 54900135	Trig Point.
GR 53820185	Radio Mast.
GR 53400130	Spot Height.

### 10.10 Obtaining a bearing in relation to Grid North

- Find a flat surface, out of the wind if possible, and place your map on it, having opened the map at the correct place.
- Estimate the approximate direction of your destination from where you are, i.e. is it west? south-east? etc. This will be used as a check later.
- Now place your compass on the map with the 'direction-of-travel' arrow pointing roughly in the direction you wish to go.
- Line-up the long edge of the base plate of the compass so that it runs from your present position, PP, to your destination, D, see diagram below.
- Rotate the compass housing (coloured green), so that its arrow (coloured yellow) points to the 'North on the map' or Grid North. (On O.S. maps this is parallel with the vertical edge of the map.) The North /South lines on the base of the compass housing should now be parallel to the North/South grid lines on the map.

- The bearing from Grid North, is shown on the index line, which in the diagram is about 113 degrees. (You could set up your own compass and check if you agree - each small division is 2 degrees on the compass illustrated.) The position of the compass needle at this stage is immaterial.

NOTE THIS DOES NOT INCLUDE MAGNETIC VARIATION

### 10.11 Longitude/ Latitude

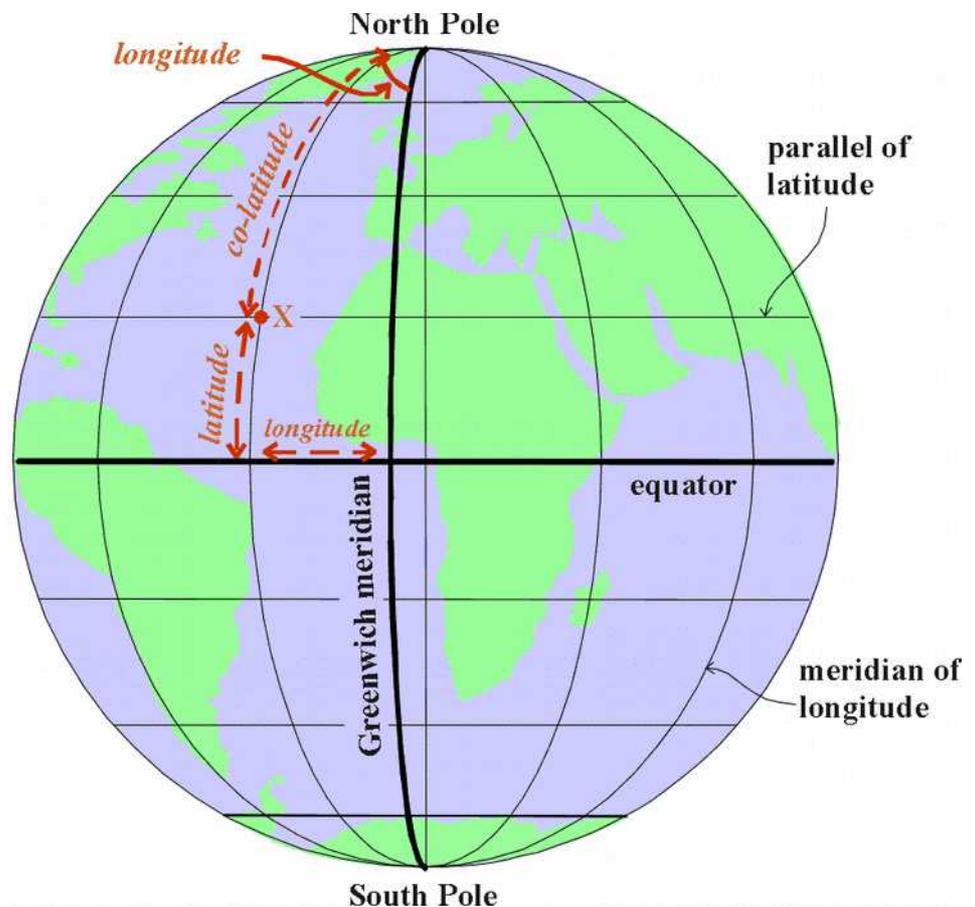
World locations are generally identified by given by their latitude and longitude (and in that order). In the UK we can also use Ordnance Survey (OS) map reference. Both are grid references but how do they relate to each other?

The lines of latitude are a series of circles of varying radius, the largest being the equator. The circles are parallel to each other, with their centres on the earth's axis.

The lines of longitude run at 90 degrees to the lines of latitude, and are furthest apart at the equator and meet at the North and South Poles so the lines of longitude are not parallel.

The North & South Poles are therefore always 90° from the any part of the equator.

The longitude circles are all the same size – unlike the circles of latitude.



### **10.12 The Ordnance Survey Grid (OS Grid)**

The Ordnance Survey Grid (O.S. grid or National Grid for England, Scotland and Wales) represents a small part of the earth's curved surface as a flat, square diagram..

The OS grid is a rectangle 700km wide x 1300km high and has a 'false' origin (f.o.) at 49° 45' 58"N 7° 33' 23"W, so as to include the Outer Hebrides and to eliminate negative numbers.

The grid for Southern Ireland (Eire) is separate.

The Ordnance Survey map of the UK are made up of 91 squares, each 100km x 100km.

Each squares are given a 2 letter code.

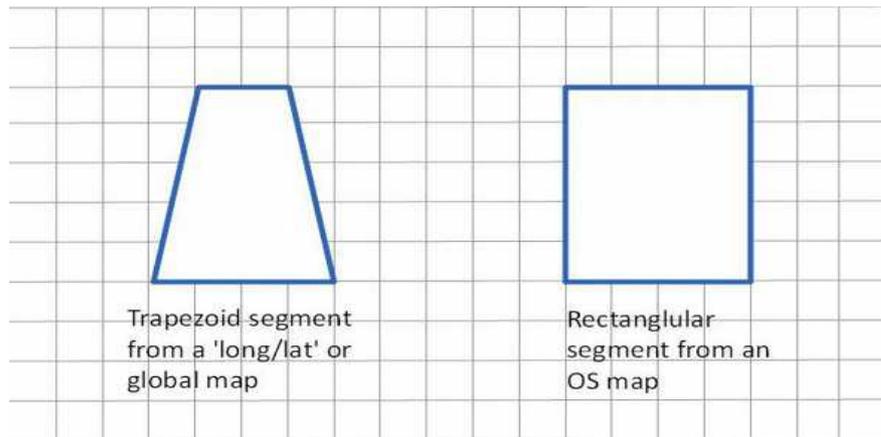
Each square is further divided by 100 horizontal and 100 vertical grid lines 1km apart. These lines are numbered 00 through to 99.

### 10.13 The OS Grid v's Longitude/ Latitude

Bear with me on this one as this can get complex.

How does the Square OS grid relate to a curved surface of earth (i.e. Longitude/ Latitude?)

The Long/Lat segments are similar to a trapezoid and the OS grid are Square.



Both systems use 4 sided segments but as one is angled and the other flat, their extended side will not all meet.

The OS grid is a square pattern placed over a picture of the UK. It 'starts' from a point off the UK South West coast. This point is known as a false origin or f.o. It was created at the start of the 1900 by the military. Using OS grid references are easier than using Long/Lat.

One vertical line on the OS grid lines up with one vertical line of Longitude. This is the left hand side of the OS grid boxes SZ, SU, SP, SK, SE, NZ, NU and is the same as  $368^\circ$  (or  $2^\circ$  West). As the Lines of latitude and OS grid lines are angled differently, this only occurs once. **This line aims** at the True North or the North Pole.

The North Pole/ True North is at a point that usually covered by a floating (always moving) ice sheet. Therefore if you are there you need to use a GPS device or calculate your position.

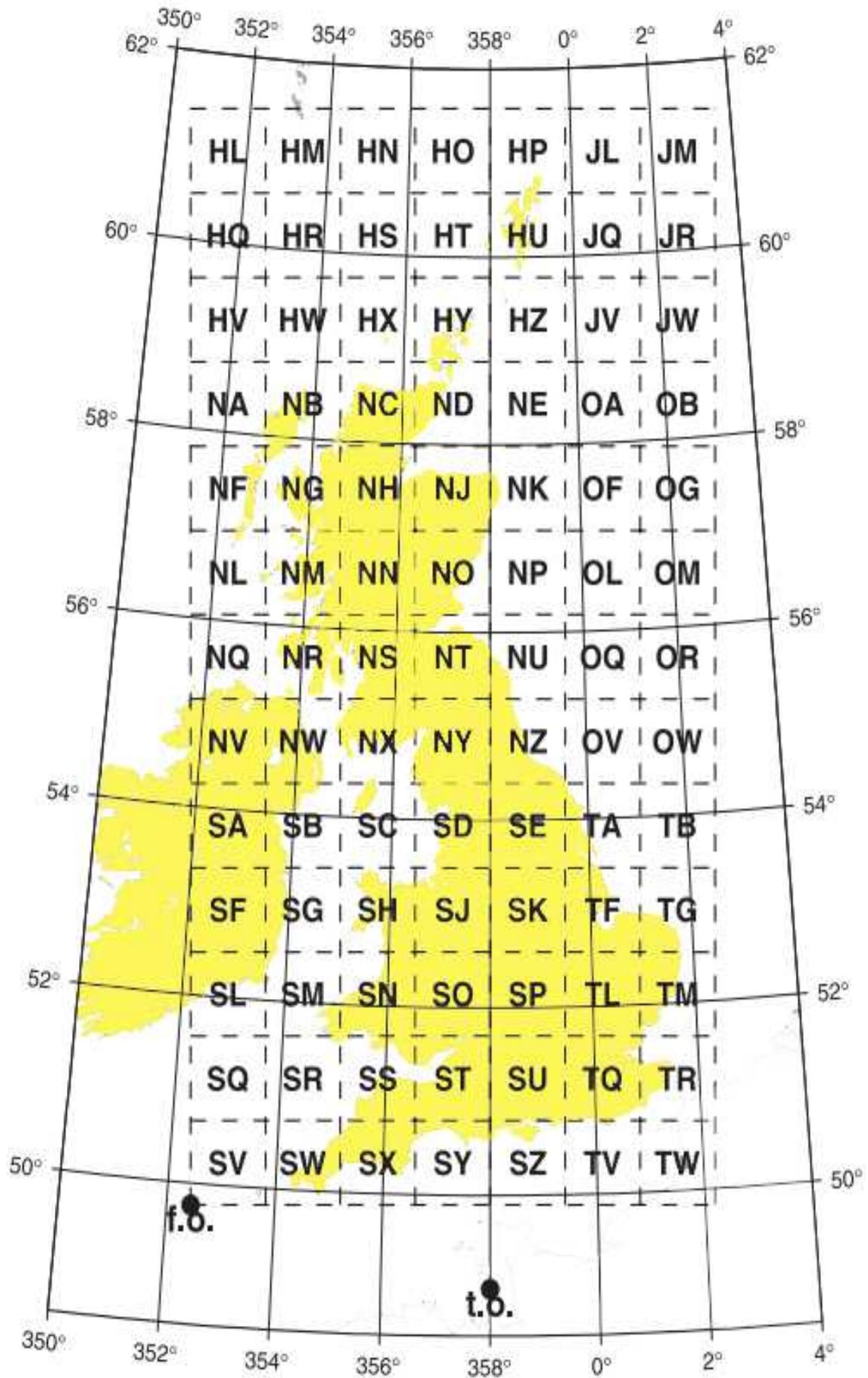
The OS grid lines to the West of this line will point to the West of True North and likewise, the OS grid lines to the east will point to the east of True North.

Also, the further west (and north) one goes the larger the angular divergence from TRUE North will be.

On the OS grid, the vertical lines are known as Eastings and the horizontal ones are known as Northings. This is perhaps opposite to what you would naturally think. Northings are called that as they increase in number value as they move North. Likewise Eastings are Vertical lines and increase in value as they move East !

The Grid Reference takes the form: **letter-code Easting, Northing**. In that order and the same order as Long/ Lat. A way to remember is that *Easting* comes before *Northing* in the alphabet.

The diagram on the next page shows the UK with the 91 OS grid boxes over it. (7 x 31) of the O.S. grid with their letter codes (HL, HM, HN etc). It also shows how it relates to Longitude & Latitude lines . The OS grid sits within the border of long/lats  $48^\circ - 62^\circ$ ,  $350^\circ - 4^\circ$



## 10.14 The 3 Norths & Magnetic Variance

As all scouts know there are 3 Norths:

- Magnetic North - what the needle points to
- Grid North - the vertical lines on an OS map points to
- True North (or North Pole) – The axis the earth spins on.

The direction of the Magnetic North and Grid North relative to True North depends on your time and place.

For the UK, (in the 2013) Magnetic North is just to the west of True North. This angle is termed the 'Declination'.

The size of Mag var/ declination is different across the UK. The position of Grid North in relation to True North depends on where in Britain you are.

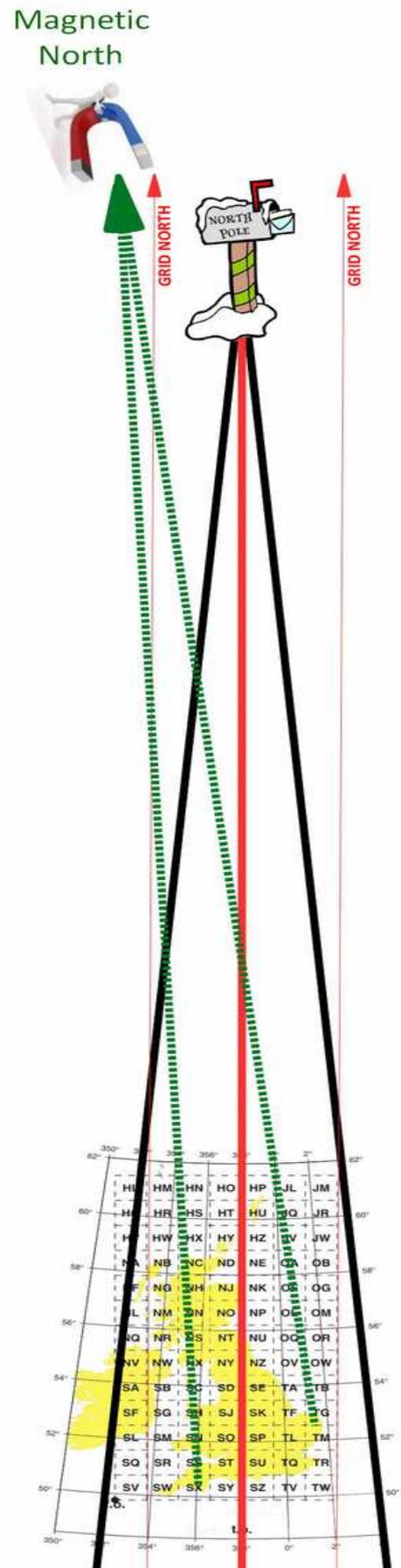
As mentioned previously, only one line on the OS grid points to True North/The North Pole.

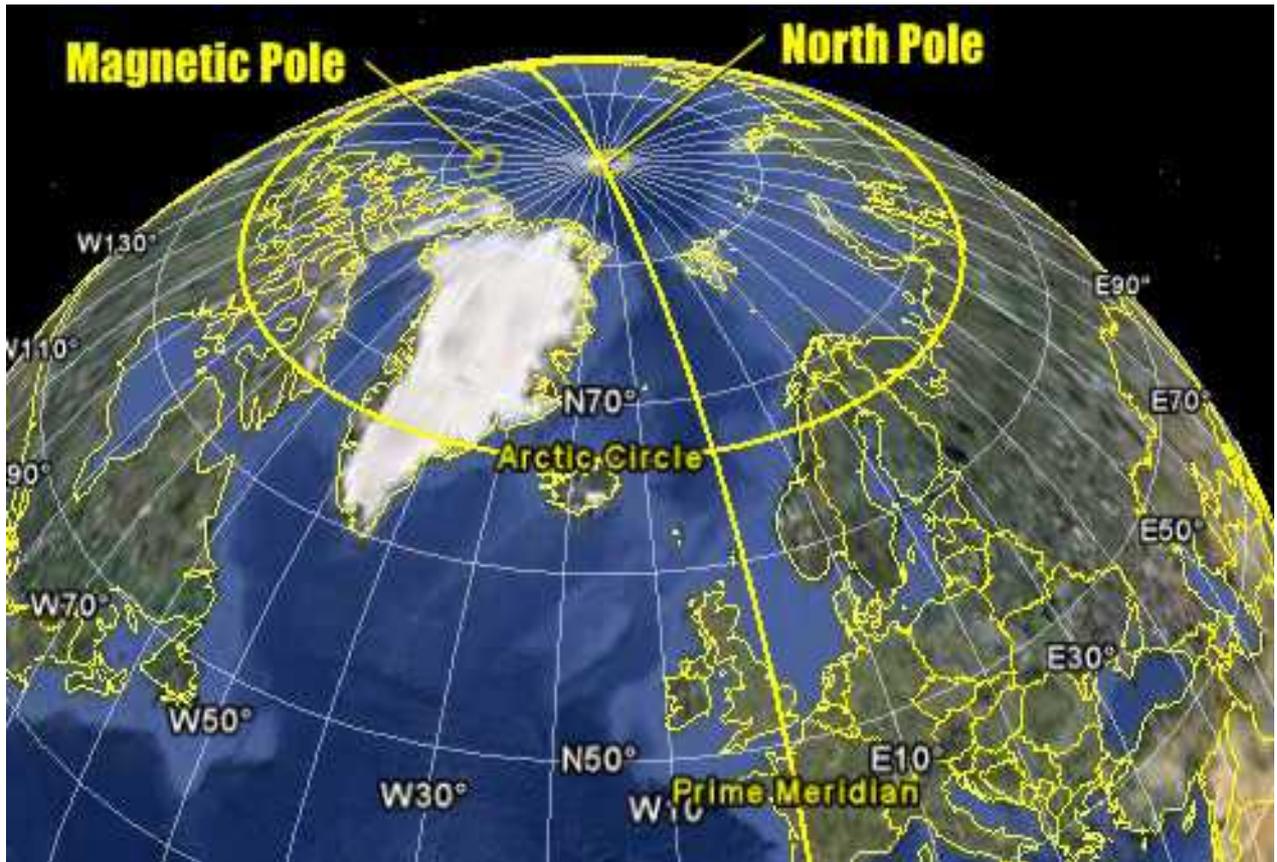
This diagram shows how only one OS map vertical thick **Red Line** (at 358°) will pass through True North (North Pole). The others pass to the east or west of True North.

The **Black Lines** are longitude lines used on globe maps. All Longitude Lines will pass through True North.

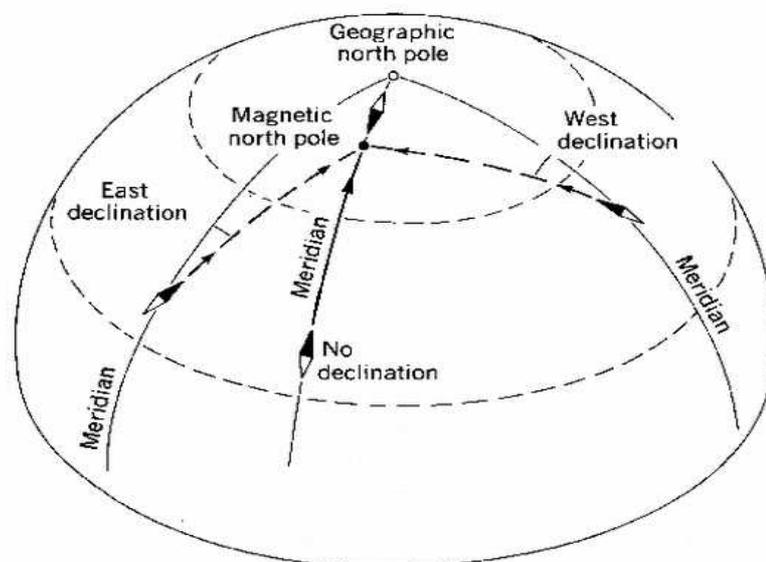
The **Green Lines** point to Magnetic North. The direction is slightly different for each part of the UK. You can see that you will always need to add mag var when going from magnetic to True North.

Therefore a precise adjustment needs to be added or subtracted depending where in the UK you are.





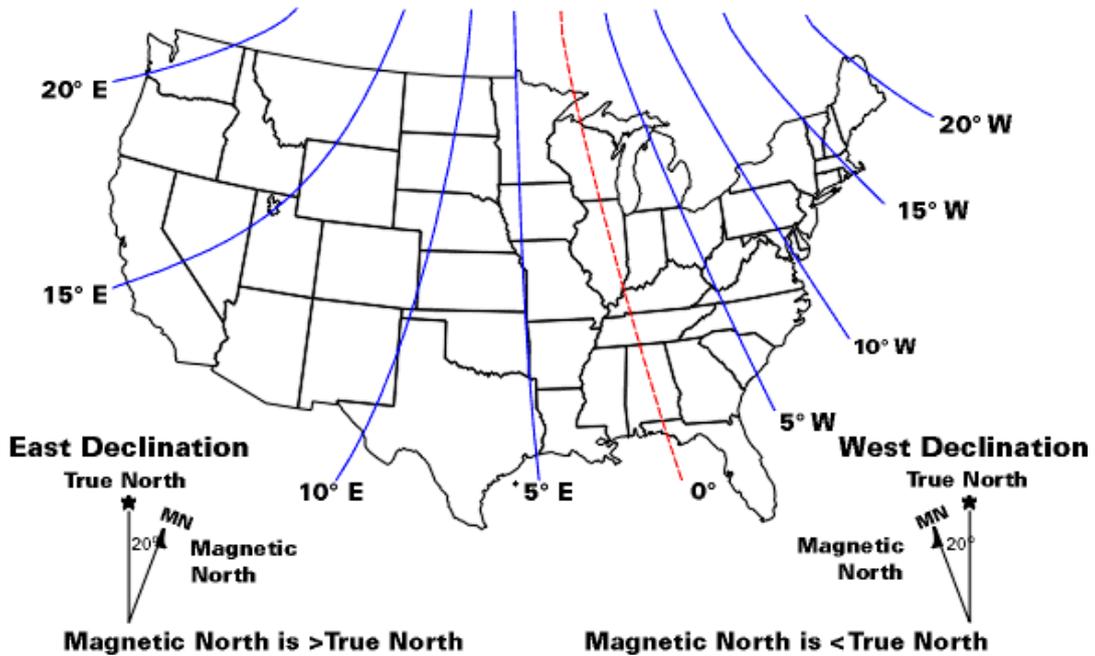
These diagrams show where the Magnetic North is in relation to the True North (or North Pole). Also if you are in a place on earth where your position , magnetic north and True North are in a straight line, there will be no magnetic variance.



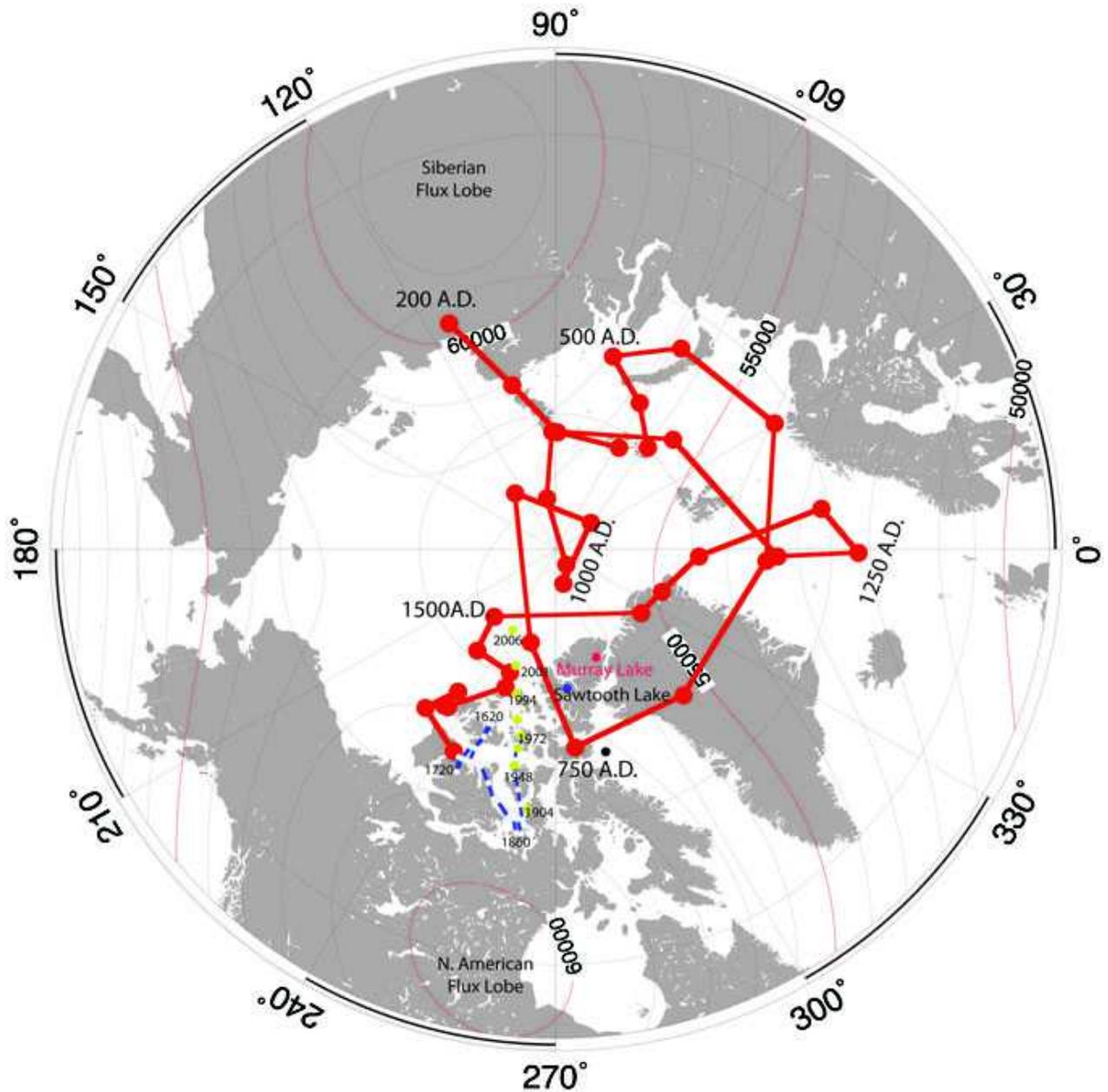
## Importance of understanding Magnetic Variance (or Declination)

In the UK, magnetic variance is very small and in some cases can be ignored.

However in large countries like the US it will always be a major factor. This diagram shows how the west coast is  $-20$  degrees and East is  $+20$  degrees. Therefore 40 degrees across the country.



The Magnetic pole is always moving – albeit slowly. This is due to the molten core that is constantly spinning inside the earth. This diagram below indicates its position over history. (How anyone could work this out I have no idea)



**OS maps showing current and future declination**

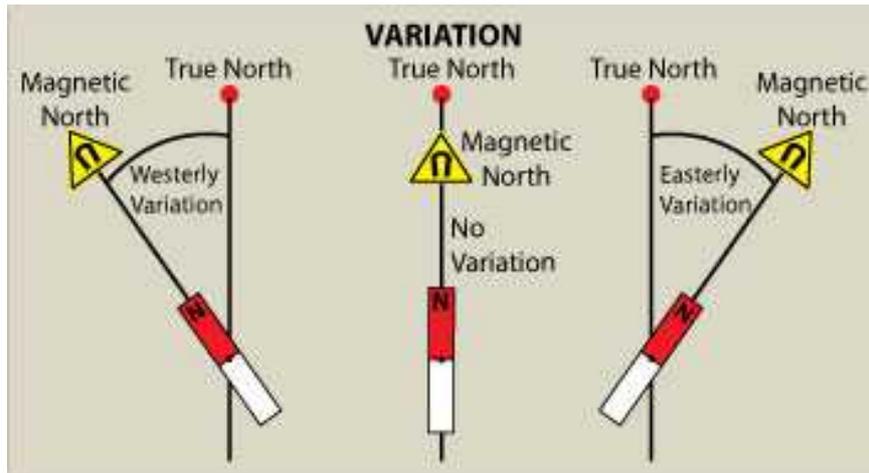
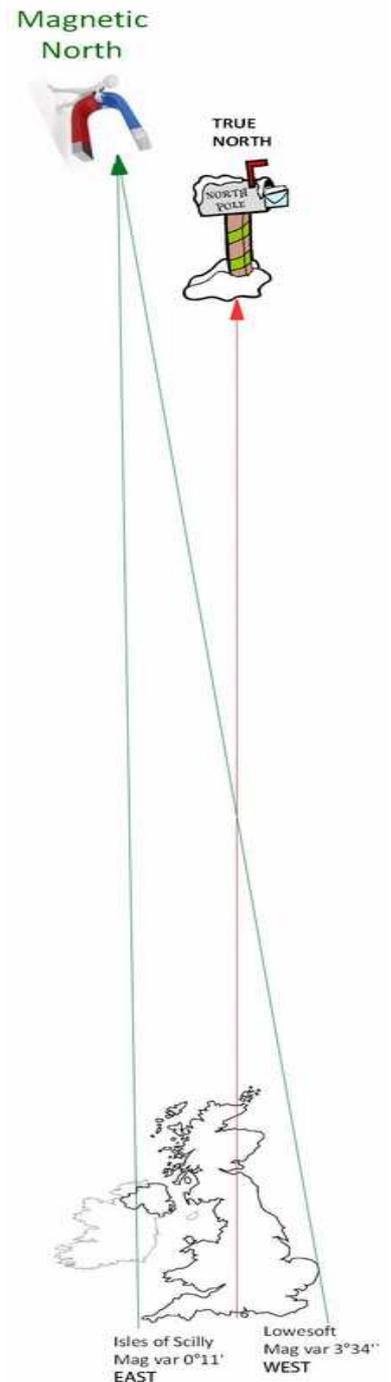
Figures quoted by OS maps for the angle between Magnetic North and Grid North vary depending on the age of the map. One version of OL5 (pennines) quotes a value of 5° in 1999, while an earlier version quotes 5° in 1997. Both state that the angle reduces by about ½° every 4 years.

However future estimates of magnetic variance on paper OS maps are just that – estimates. For a more accurate value for the angle between Grid North and Magnetic North for any location in the British Isles can be found by going to the Geomag website:

[http://www.geomag.bgs.ac.uk/data\\_service/models\\_compass/gma\\_calc.html](http://www.geomag.bgs.ac.uk/data_service/models_compass/gma_calc.html)

Out of academic interest, the Isle of Scilly (40km off Land's End) has a magnetic difference of  $0^{\circ} 11'$  **WEST**. As this is so small (60 minutes ' to a degree, 60 seconds'' to a minute etc) it can be ignored.

However if this figure was larger, you would need to subtract the difference when going from 'map' to 'real world'. Whereas the rest of the UK has a magnetic variance that is **EAST** and therefore you would need to add it to a bearing when going from 'map' to 'real world'.



The value given for Penrith for July 2007 is  $3^{\circ} 7'$ , a difference of more than  $\frac{1}{2}^{\circ}$  compared with the value derived from data given on OS maps. Fortunately it is unlikely that this small difference will prove to be of practical significance given the difficulty of walking on a bearing to this degree of accuracy using a simple compass like that above.

This table shows locations (roughly west to east across Wales and England), their OS grid ref and the current Magnetic variance:

Location:	Isle of Scilly	Lands End	St. Davids head	Brecon	Gloucester	Milton Keynes	Ipswich	Lowestoft
OS co-ord	SV 836 063	SW 341 253	SM 719 280	SO 061 286	SO 850 193	SP 845 376	TM 180 441	TM 552 937
Mag-var 2013	<b><math>0^{\circ} 1' E</math></b>	$0^{\circ} 5' W$	$0^{\circ} 18' W$	$1^{\circ} 19' W$	$1^{\circ} 47' W$	$2^{\circ} 25' W$	$3^{\circ} 16' W$	$3^{\circ} 34' W$

The above table shows how the current magnetic variance is different over the UK. The difference across this part of UK is nearly  $4^{\circ}$  – which really is nothing for short navigation but is shown here to understand the point.

## **11. Advanced Navigation, Map and Route Planning**

References:

diagrams and material from various websites, Hill walking book by Stephen Long, Army Cadet Navigation Training, Ordnance Survey, Penrith Ramblers website.

**This section will discuss:**

- Gathering clues
- Breaking route into small sections
- Triangulation
- Back bearings
  
- Macro Navigation
- Micro Navigation
  
- Paths, Handrails, Funnels
- Tick features
  
- Aiming off
- Attack points
- Boxing/ dog legging around obstacles
  
- Contouring
  
- Search patterns / spirals etc

### **11.1 Gathering clues**

Improving your navigation skills is a never ending process and one that benefits from constant fine tuning.

Comparing visible features on the ground to the information on the map helps to build an understanding that becomes invaluable in difficult conditions.

High vantage points that look down on the landscape are excellent places from which to develop an understanding of the relationship between the map and the ground.

When visibility is good, a useful exercise is to compare landmarks with the map and to note which ones are hidden behind landforms.

Any contours of the same height or higher than the observer's position will obscure features beyond them unless these features are significantly higher.



Working with a variety of maps and scales also helps to build the ability to visualise the land and the cartographer's attempts to depict it in on a flat sheet.

Features can be categorised as three types: Spot, Linear, Area.

- **Spot features:**

Single point features, such as:

- a summit ,
- path junction,
- or enclosure.

These features pinpoint a particular location.

- **Linear features:**

Anything elongated but narrow, such as:

- a path,
- stream or narrow ridge.

- **Area features:**

These are features that do not necessarily have sharp edges, such as:

- a lake,
- woodland,
- a slope or marsh.

Where boundary fences exist, linear features are also created and if these fences have corners or intersections then a spot feature is created.

Anything with an orientation can be used to provide clues about direction. Slopes are an important example, providing a wealth of information that can be overlooked.

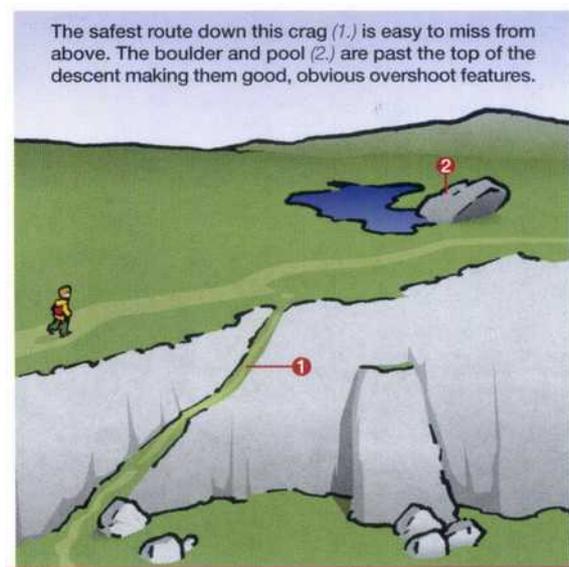
It is easy to disregard clues that contradict the assumption that everything is on course; the experienced navigator learns to use every new piece of information to challenge the assumption that everything is OK.

A useful technique when trying to confirm a particular location is to seek out five features that support the hypothesis that it is a certain place on the map.

### **11.2 Breaking a route into small sections**

Dividing a route into manageable sections, known as legs, is a common strategy for navigators. Often in poor visibility, this will necessitate micro-navigation, which means moving from one subtle micro-feature to another, relying on detail that would probably not need to be observed in clear conditions.

This is an important skill for navigators to develop to a high standard of accuracy if all-weather route



finding is to be achieved. Navigational requirements in difficult conditions often affect the choice of route.

Sometimes a direct line to a destination takes the party through vague, indistinct terrain, whereas a circuitous route can link several identifiable features, allowing regular confirmation. Choosing a route that crosses several line features allows more than one opportunity to confirm that things are on course.

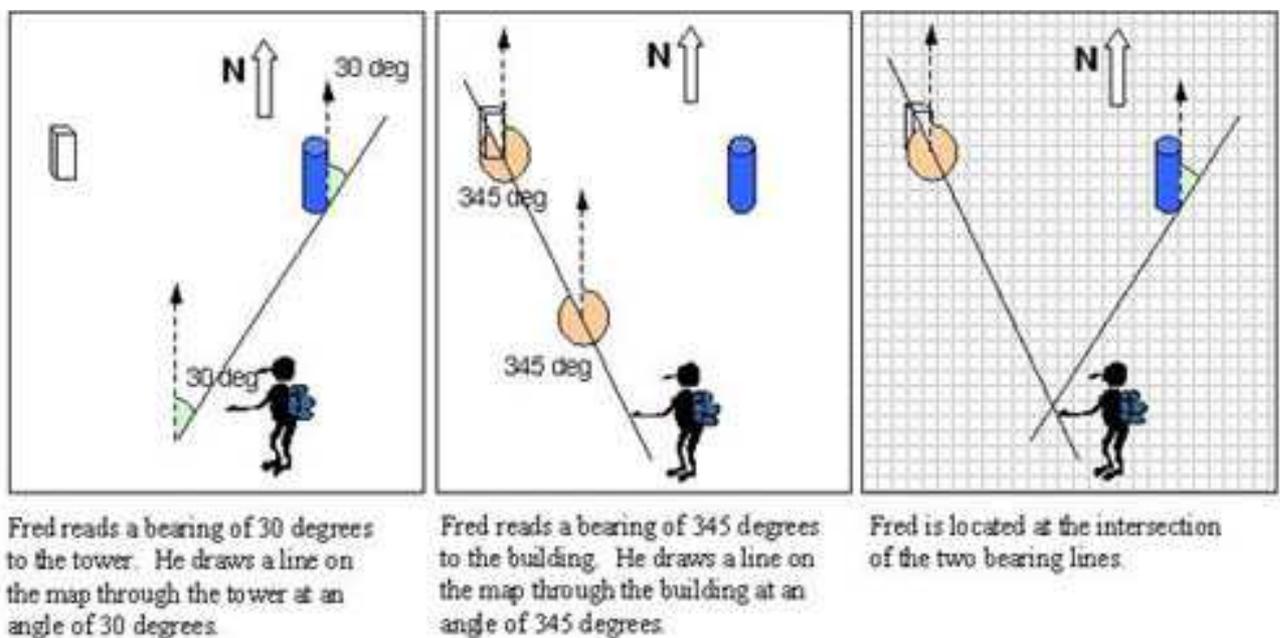
Regular checks allow warning signals to be picked up rapidly if a mistake is made, helping to minimise the distance covered in the wrong direction. Areas bounded by distinct overshoot features are particularly useful. These are usually line features such as a boundary or track that help to warn the navigator that they have walked beyond the intended feature and suggest a re-appraisal. With a little planning a potential overshoot feature can be approached head-on rather than at an oblique angle where it might be missed.

It may be also possible to link two sections together using funnel or corridor features, such as valleys, converging crags or walls. These form a natural boundary, which leads the navigator naturally to a chosen point

### 11.3 Triangulation

This is used to confirm your position when you know roughly where you are but you are not exact.

You must first make sure you can identify several landmarks (at least 3 to on the safe side) both in real life and on the map.



1. Locate 3 prominent features approx. 120° apart
2. Work out the bearing of one of the features
3. Find the feature on the map
4. Place the compass on the map so that the edge of the compass points towards the feature

5. Rotate the entire compass until the meridian orienteering lines (the faint blue lines marked on the dial itself) are aligned with north on the map (e.g. a vertical blue grid line on the map). **Note:** This method has NOT taken magnetic variation into account and this may produce a serious error depending upon your position on the Earth
6. Draw a line from the feature back towards your position (you should be on this line somewhere)
7. Now repeat all of the above for the other landmarks
8. Your approximate position should be where the lines intersect. In practice if you have taken 3 readings then the lines will produce a triangle ( in theory they should intersect but this rarely happens in practice!). Your position is somewhere within the triangle (hence why the process is called triangulation)

If you know your position to be on a easy to recognise feature (e.g. you are standing on top of a hill, in a stream or better still in a pub) then only one or two bearings should be needed. Simply look at where your line crosses the hill crest, stream or bar.

#### **11.4 Back-bearings**

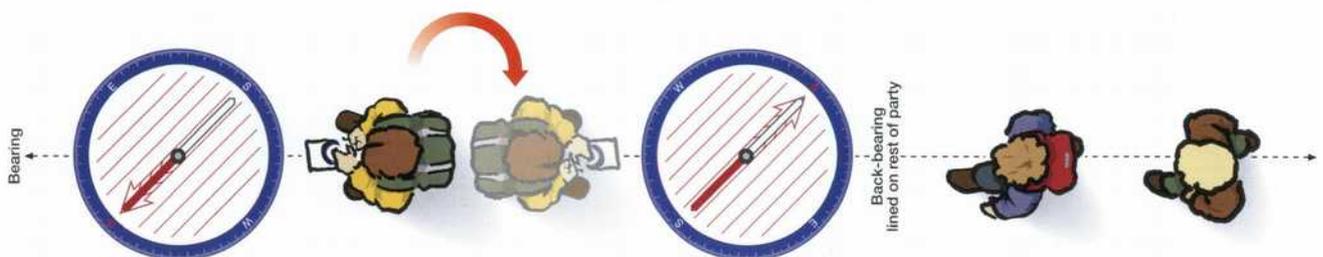
Taking a bearing back along the route already travelled can often allow the direction of travel to be checked.

This is a simple matter if the starting point can still be seen, but even in poor visibility, a back bearing can often be taken by aiming back along the other members of the party.

The simplest way of obtaining a back-bearing is to rotate the compass so that the south end (not the red end) of the magnetic needle floats over the north arrow that is drawn on the needle housing.

It is also possible to add or subtract  $180^\circ$  from the bearing and alter the housing, but this is usually unnecessary work and more likely to lead to error.

If drifting from the correct line has occurred, it may be possible to solve by turning at right angles and walking until the back bearing has returned to the correct line.



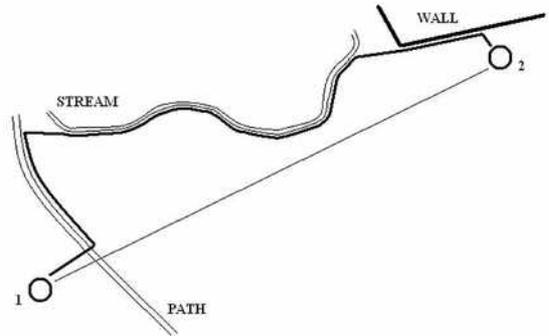
The leader walks to a bearing then occasionally turns around. Using the walkers behind him as an indicator of '180° difference' or better still to use a feature you have just walked from. For example: a farmhouse, foot path crossing, fork in river etc

### **11.5 Following paths & 'hand rails'**

With good visibility, popular paths are often easy to see, because of the footprints, erosion or even its man-made surface. In these conditions, navigation consists mainly of keeping track of the direction and distance travelled.

Along the way, a variety of features are likely to be passed, allowing navigators to re-affirm their position continually while travelling along the path.

We call these 'tick' features and can be likened to passing stations on a train journey. As long as the train stays on the tracks, stations will always be passed in the right order.



A handrail is anything that you can walk along by or parallel to. It will take you along the path to your destination.

For instance the edge of a wooded area, a cliff edge, a stone wall etc.

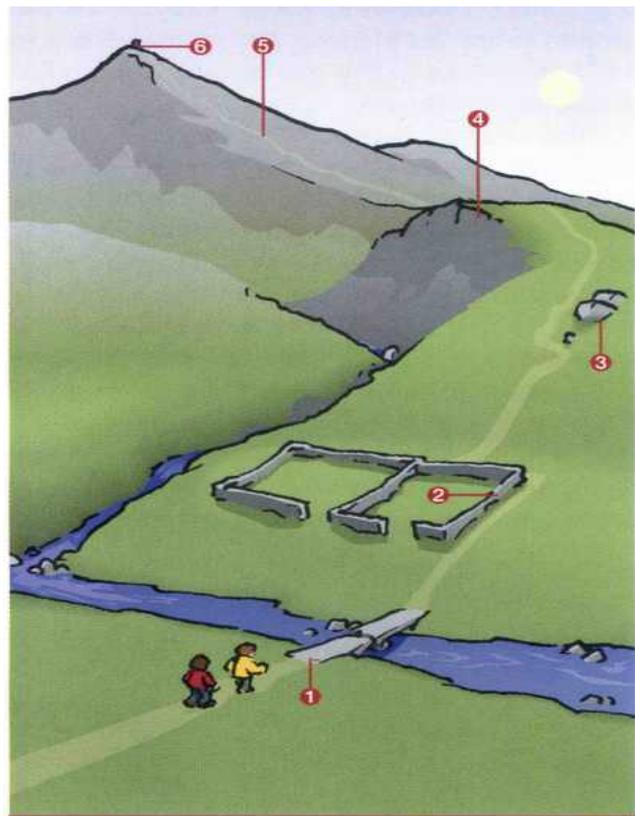
### **11.6 Following features (tick, handrails)**

Many features can be used as handrails. These may be very easy to follow, or require great skill, particularly in poor visibility.

Suitable linear features include fences and walls, overhead cables or pipelines, streams, escarpments, and sometimes landforms such as ridges or valleys.

On distinct slopes, it is often possible to use a contour as a line feature, by taking care to maintain the same height.

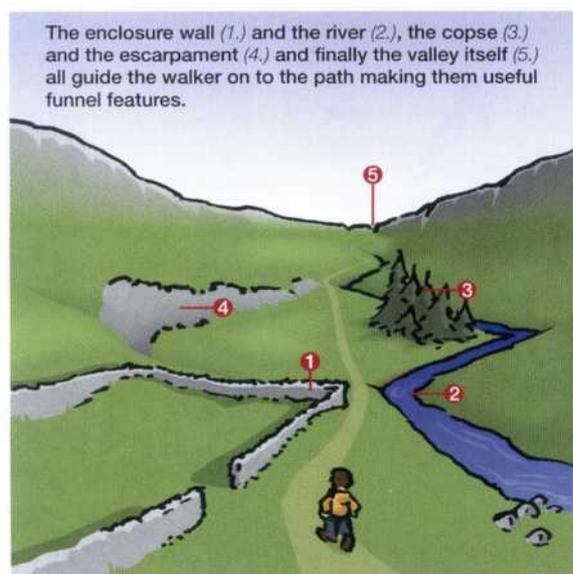
- Cross the bridge (1. tick feature),
- then follow the edge of the enclosure (2. handrail),
- strike out for the boulders (3. tick feature)
- and follow the top of the escarpment (4. handrail).
- Ascend the ridge (5. handrail) and
- reach the trig point on the summit (6. tick feature)



Whenever the navigator follows a handrail feature, tick features such as crossing a wall or passing a path junction should be noted and the distance and direction travelled should be monitored, particularly in difficult conditions.

Linear features may become indistinct in places or may have been repositioned since the map was made, so it is important continually to assess the situation.

The diagram to the Right indicates how you can 'funnel' using handrails and tick features as the funnel walls.



### **11.7 Aiming off**

Drifting off from a bearing by as little as five degrees will lead to an error of nearly 50 metres after walking only half a kilometre.

This is a good reason for keeping navigational legs relatively short, but also means that trying to walk on a bearing straight to a point feature such as a bothy is quite optimistic in thick mist. To journey through featureless terrain in dense mist with the hope of finding a bridge over a stream.

As long as the bearing cuts across the stream, it will not be very hard to find this line feature: but if the bridge is not visible, should the party turn upstream or downstream? Aiming off is a classic navigational strategy, which eliminates this quandary.

The party deliberately sets a bearing a few degrees to the side of the bridge - usually uphill, then turns downhill upon reaching the stream, using it as a handrail to the bridge.

The uphill deviation is used to prevent dropping down too low and then having to regain height to find the destination.

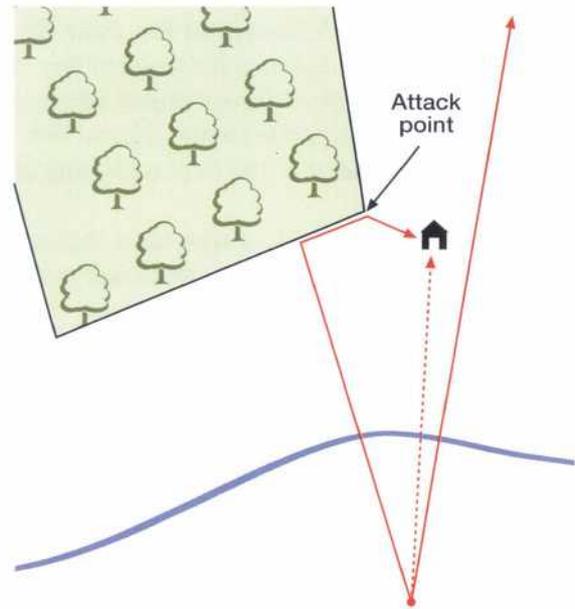
This technique is particularly useful for finding stream junctions or other features located on linear features, which may be invisible from just a few metres distance.

### **11.8 Attack points**

A useful strategy in any conditions for seeking a poorly defined feature is to identify something clearly distinguishable within a few hundred metres. Having located this attack point, a more cautious systematic approach can be used to pin-point the required feature.

This is often described as using two different styles: rough navigation to locate the attack point, and fine navigation to find the actual feature. For example, in poor visibility it might be necessary to locate a sheepfold for shelter.

In open moorland this would be a difficult task but with a clear feature two hundred metres away, such as intersecting walls, it might be possible to use rough navigation to find the intersection and then fine navigation (dead reckoning on a bearing) for the final two hundred metres.

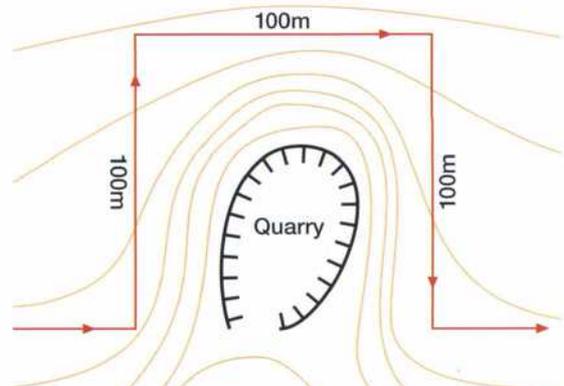


### **11.9 Boxing around obstacles**

Sometimes when following a bearing it is necessary to make a detour around an unexpected obstruction, for example an unmarked enclosure, boggy ground or escarpment.

It is possible to make a series of turns around the object in order to get back in line on the bearing. This technique, known as boxing, is simplest when 90° turns are made.

The first step is to turn at right angles from the bearing, until the magnetic needle points to east or west (according to the direction turned). The direction of travel arrow now shows a bearing at right angles, without having to make any calculations. This bearing is followed, measuring distance until beyond the obstacle. The original bearing is then followed until it is possible to turn back beyond the other side of the obstacle.



**The navigator turns to move back towards the original line of travel, until the magnetic needle points to west or east (the opposite of the previous detour). This is followed for the same distance as the detour and thus the original line is reached, having followed three sides of a square - only the side that is parallel to the original bearing should be included in the total reckoning of distance travelled. Whenever possible, a box with sides that are parallel or at right angles to the slope will make it easier to keep on course.**

### 11.10 Dog Leg Contours

Similar to boxing but just using 45 degree instead of 90 degree.

Fine if you can see where the obstacle ends so your 45 degree (or whatever angle you choose) can get you past the half of it.

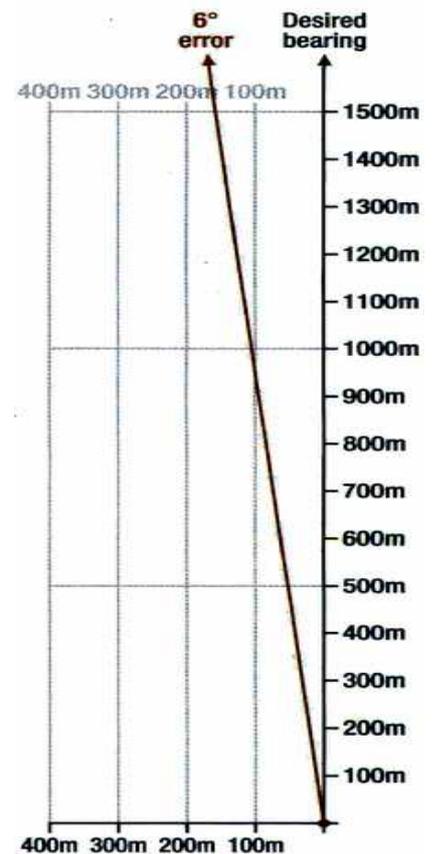
### 11.11 Deliberately Blank

### 11.12 Drifting off & inaccurate bearings

Everyone has a natural tendency to walk to the left or right without knowing it.

You should try to practice walking on a bearing on a large flat open area. When you have walked say 500metres, stop and check how much you have drifted off. You should then allow for this in your navigation.

Likewise you should read the bearing carefully to avoid error. E.g. does the compass say  $127^\circ$  or  $129^\circ$



Detail like this will enable you to become a precise navigator, especially for zero visibility situations. For example being caught in dense fog on an unfamiliar hillside side.

Also, you should be very precise in reading a compass. As the diagram shows, an error of  $6^\circ$  (say  $4^\circ$  for inaccurate compass reading and  $2^\circ$  drift off) means being out over 50m over 500m or 100m out over 1km.

You could easily miss you exit path or a tick feature with such inaccuracy.

### 11.13 Counting paces

You should be able to get to the level where you know how many of your steps it takes to walk a set distance. Say 100m or 350metres.

Some of you young minds can count and walk at the same time. Others of mechanical counters – like on ones used by 'bouncers' in clubs and pubs. Be careful that metal ones tend to cold if the wethers is like that. Newer designs are LCD displays in a plastic case. In very cold conditions these might be slow to display and the LCD may stop working altogether.

Some are mechanical clickers (Tally counters) as used by night club bouncers, other are small electronic silent versions. Others might use beads on a string or even moving small stones from one pocket to another. What ever method works for you then that's fine.



### 11.14 Ranger beads

Ranger beads can be made yourself using some strong cord and some beads. You will need 9 + 5 beads. There's often a loop in the upper end, making it possible to attach the tool to the users gear with a simple Prusik knot.



As they walk, they slide one bead on the cord for every ten paces taken. On the tenth pace, the user slides a bead in the lower section towards the knot. After the 90th pace, all 9 beads are against the knot. On the 100th pace, all 9 beads in the lower section are returned away from the knot, and a bead from the upper section is slid upwards, away from the knot.

For this to be effective you will need to know your 'stride' length so you can calculate what distance you have walked.

### 11.15 Walking crib card

This is a card that shows the metres to be walked, the number of Double-steps (or D-steps) and the time it should take to walk that distance. It needs to be personalised to the walker. Someone with short legs will have a totally different stride to someone with long legs.

To create a walking crib card, find a flat piece of ground where you can walk an exact 500m or 1km.

It is important to walk it by yourself so you are not influenced by other peoples walking pace. Count the number of Double steps (or D-Steps). We use D-steps as they are easier to count.

**By referring to the the card example here,  
to walk 650 metres  
= 500m + 150m  
= 311 + 93 D-steps  
= 404 steps.**

**If you are walking at 3km/hr,  
it will take  
10 mins (10') +3mins (3')  
= 13 minutes.  
(or 9.75 or roughly 10 mins @ 4km/hr)**

metres	D-steps	@3 k/h	@4 k/h
1	1	1"	
5	3	5"	4"
10	6	10"	7"
20	12	20"	30"
30	19	40"	38"
40	25	50"	.75'
50	31	1'	1.5'
100	62	2'	1.5'
150	93	3'	2.25'
200	124	4'	3.0'
250	156	5'	3.75'
300	187	6'	4.5'
350	218	7'	5.25'
400	249	8'	6.0'
450	280	9'	6.75'
500	311	10'	7.5'
1000	622	20'	15'

If you walk at 4km/hr but struggle with maths, you can use the 3km/hr for you calculations and just convert to the standard 4 km/hr by just adding a ⅓. Simples.

Remember you will walk slower if carrying a heavy load (like a fully loaded rucksack), or walking on unstable ground (for example boggy). So adjust your estimate accordingly.

### 11.16 Calculating time to walk up/down slopes

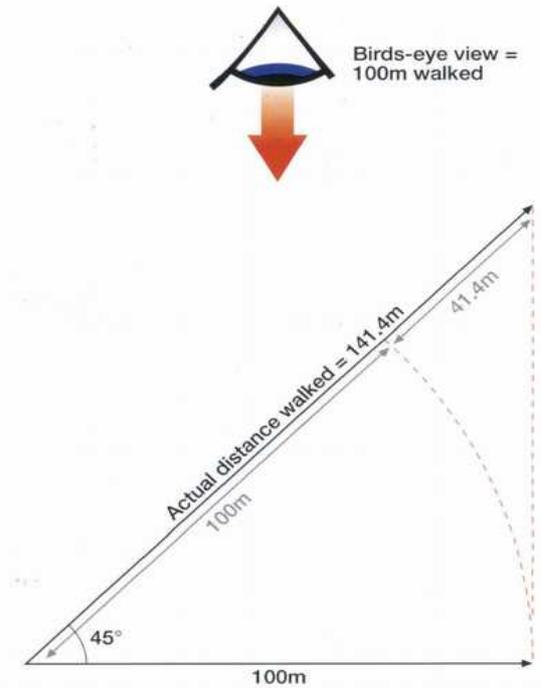
The normal maps we use for walking in the countryside are drawn from a 'birds-eye' view.

As they are flat (2 dimensional ) they use contours to indicate a (3 dimensional) slope. It is not obvious what the actual length of the slope is. A slope is always more than a 'birds eye view' of it. (see diagram with 'the eye' looking down)

For example; a 45° slope on a map has a 'birds eye view' length of 100m. The actual length is 141metres. (pythag theorem,  $a^2=b^2+c^2$ ). Also walking will be slower/ require more effort uphill and probably faster/ easier down hill.

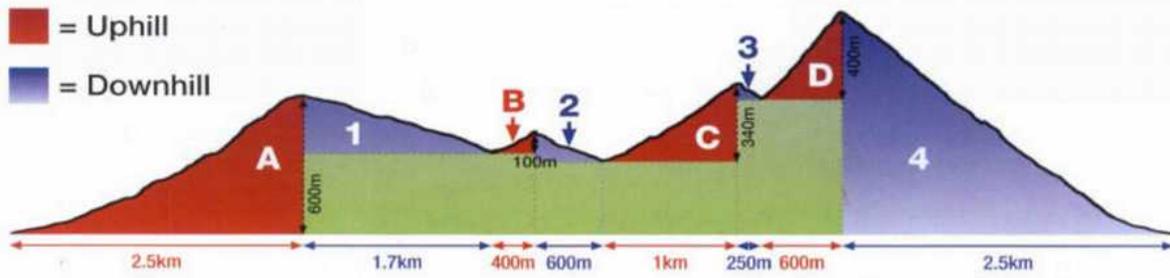
We need a method to calculate how long it will take us to walk up/ down a hill. This is where 'Naismiths Rule' comes in. This is 'rule of thumb' that was devised by William W. Naismith, a Scottish mountaineer, in 1892.

The basic rule is: **Allow 1 hour for every 3 miles (5 km) forward, plus 1 hour for every 2000 feet (600 metres) of ascent.**



**KMD TO ADD HOW NAISMITHS CAN BE USED FOR FLAT GROUND AS WELL**

The rule for this is 'Naismiths Rule'. Here is a table explaining it better.



Uphill		Downhill
Horizontal timing	Vertical timing	Horizontal timing
<b>A</b> = (2.5km @ 5km/h = 30 min) + (600m ↑ @ 10m/min = 60 min) = <b>90 min</b>	<b>1</b> = 1.7km @ 5km/h = <b>20.4 min</b>	
<b>B</b> = (400m @ 5km/h = 4.8 min) + (100m ↑ @ 10m/min = 10 min) = <b>14.8 min</b>	<b>2</b> = 600m @ 5km/h = <b>7.2 min</b>	
<b>C</b> = (1km @ 5km/h = 12 min) + (340m ↑ @ 10m/min = 34 min) = <b>46 min</b>	<b>3</b> = 250m @ 5km/h = <b>3 min</b>	
<b>D</b> = (600m @ 5km/h = 7.2 min) + (400m ↑ @ 10m/min = 40 min) = <b>47.2 min</b>	<b>4</b> = 2.5km @ 5km/h = <b>30 min</b>	
<b>198 min</b>		<b>60.6 min</b>

### Calculating timing for an undulating ridge

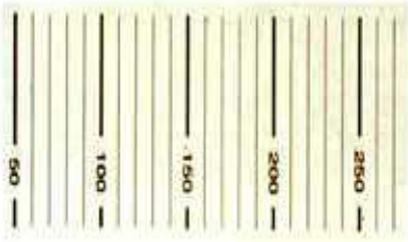
Uphill time	198 min
+ Downhill time	60.6 min
+ Breaks & lunch	90min
<b>Total journey time</b>	<b>348.6 min</b>

### 11.17 Easter Eggs

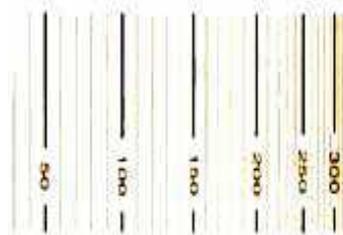
These are marked features on a map that do not exist in real life. Common examples: are sheep pens, fence lines, buildings. They are ways to prove copyright of a map. The author deliberately draws them in so if someone copies it, the case can easily be proven.

Therefore if you are precisely navigating to that sheep pen and it is not there, then you may not be lost !

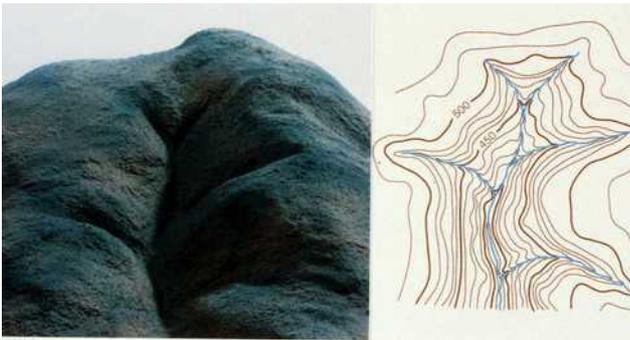
**11.18 Recognising map contours to real world slopes**



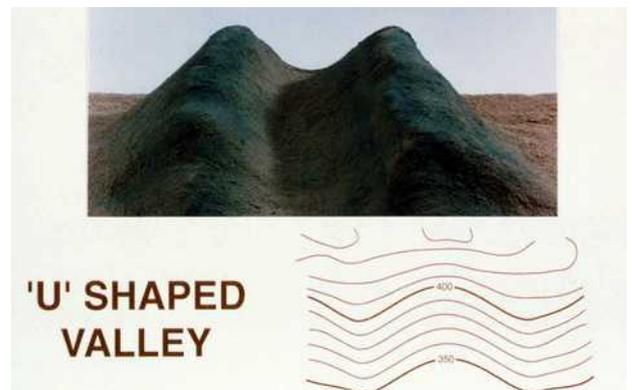
**EVEN SLOPE**



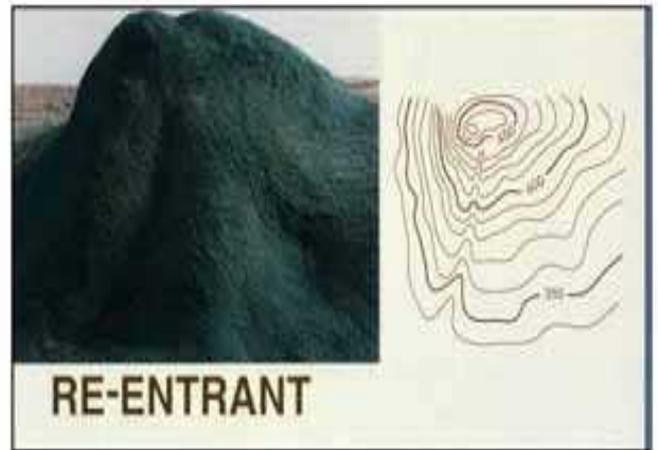
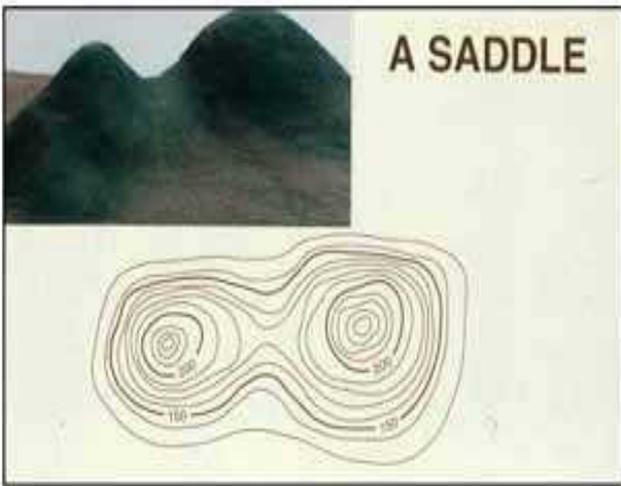
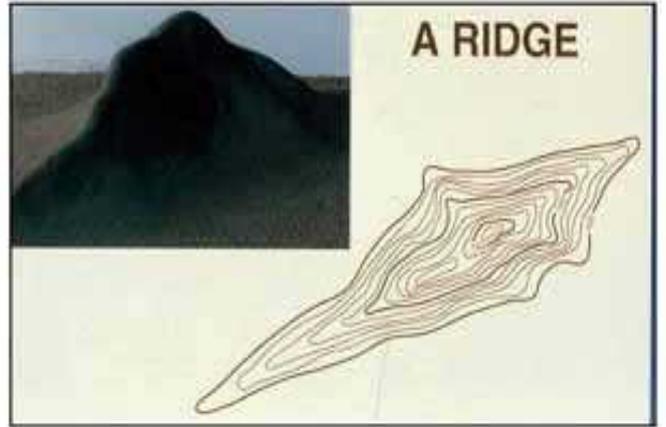
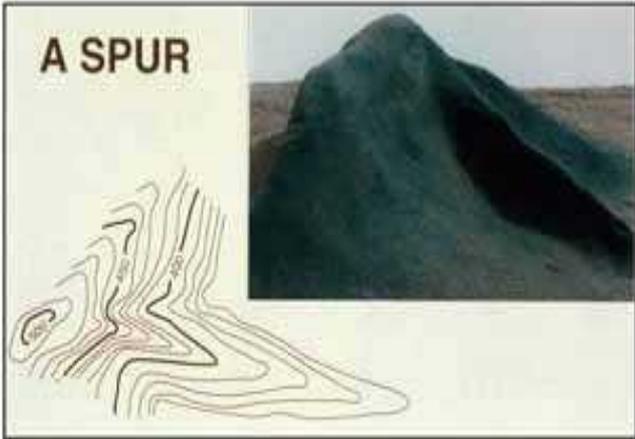
**CONCAVE SLOPE**



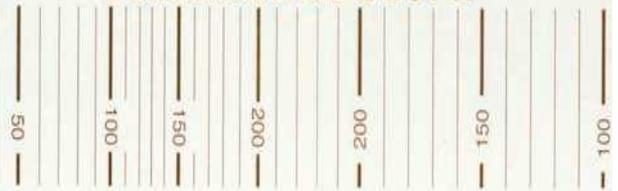
**'V' SHAPED VALLEY**

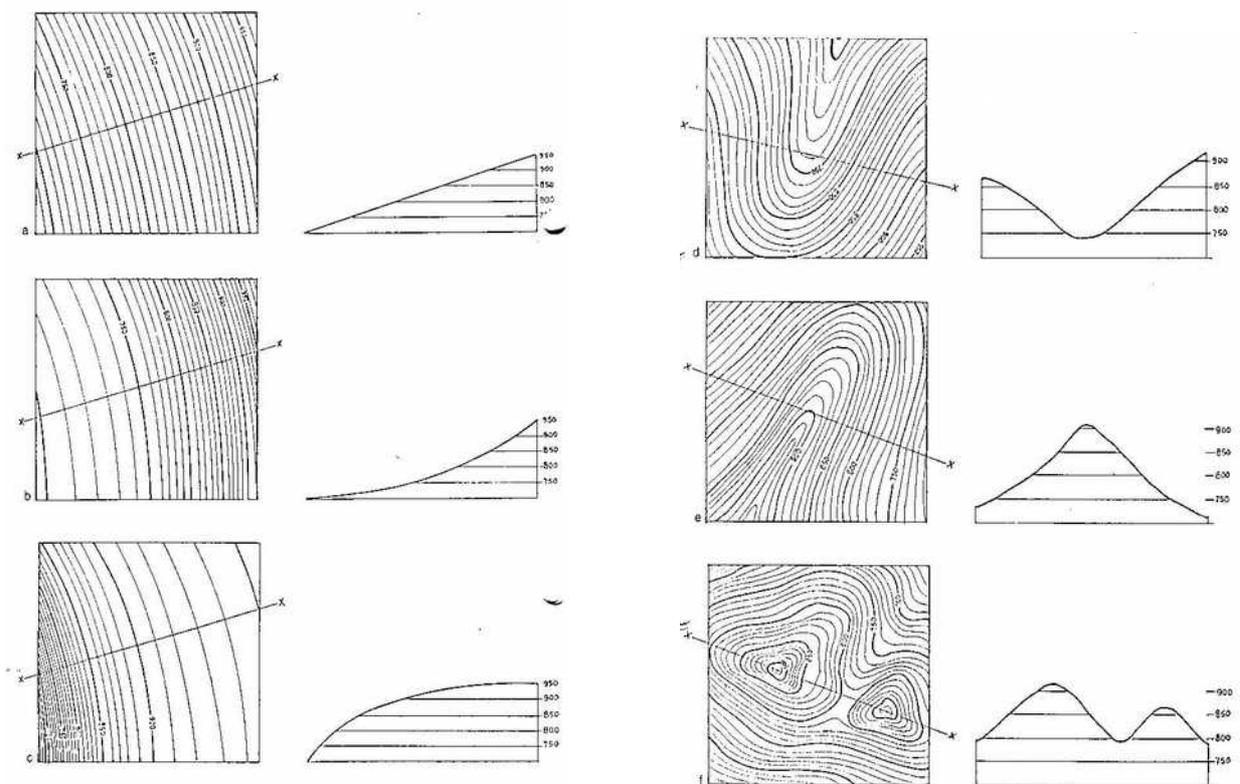


**'U' SHAPED VALLEY**



**CONVEX  
SLOPE**





## **12. Route cards**

On most training courses, 'route cards' are either missed out entirely or given such little time they becomes meaningless. That is very wrong.

In this section you will learn:

- What a route card is
- Who constructs it
- Who it is for – its audience
- What it is used for
- What needs to be on it (for the various expedition levels)
- Various route card styles

### **What a route card is**

A route card is a document with your route described on it.

The route is usually broken down into 'legs'.

These are short parts of the expedition (perhaps every 1-2km depending on the terrain and features).

Each 'leg' shows timings and distance.

### **Who constructs a route card?**

Route cards are written by the expedition team. i.e. the people hiking, riding, sailing the expedition.

It is then checked by the adult 'Supervisor' who may return it to the team for amending.

It will then be submitted to the DofE Assessor for checking. They may also return it to the Supervisor and team for amending.

### **What a route card is used for:**

Depends who is reading it !

An assessor reads a route card:

- to get an indication if the group have 'planned' their expedition
- to know where and when they are meant to be somewhere

A expedition member:

- needs the details of direction, distance and features to look out for

Base camp support team:

- need to know where you are  
in case you don't get back  
there is an emergency and need to give you more information

What needs to be on it (for the various expedition levels):

There are basic details all route cards should include

- OS grid positions of check points, camp sites etc.
- Time of start, time of legs, expected time of arrivals
- Title of legs (natural parts of the expeditions)
- Detail description of that leg (direction, distance, feature)
- Contain appropriate detail for that level of expedition (first class/ Bronze/ Silver/ Gold/Discovery etc)

There are other details it may have on it

- names of expedition members
- names and mobile numbers for Supervisor & Assessor

Various route card styles

There is no single way of creating a route card. There are many styles but it should be try to be clear for its intended audience.

## The route card

The route card is a valuable learning process that encourages participants to recognise the importance of attention to detail and careful organisation. It is also a key tool in enabling participants to identify and manage risk in their expedition route. It also indicates well thought planning.

The route card informs the Supervisor, expedition support staff and the Assessor where the team is going and when they will get there. It is the cornerstone of expedition safety.

Route cards act as a log of the journey and are a live document which participants will update as their expedition progresses. They enable participants to compare their actual times of arrival to their estimated times and so judge their own progress against their original plan. This will enable more accurate future estimates.

### **Building a route card**

Participants complete their route cards as a team following this basic process:

a) Choose departure point:

Using a separate route card for each day, participants record their departure point and the end point for the day's journeying.

b) Define route legs:

After planning the day's travel, participants divide the route into natural divisions of roughly equal length ending at an unmistakable landmark. These become expedition 'legs' ending in a 'checkpoint'. A route containing between six and eight checkpoints is suitable for a day's journey.

c. Estimate timings:

Participants then estimate the time needed to complete each leg. A good team can work out average distances and timings based on their training and practice expeditions. Participants need to take into account additional time needed for height gained using Naismith's rule, rest periods and for undertaking project investigations. Reasonable time for lunch should be included and it is good practice to identify this as a checkpoint.

d. Calculate ETA:

Using their estimated timings participants can calculate what time they will arrive at each checkpoint and what time they will set out on the next leg. Participants will also add in their information on bearings (based on the level of their competence) and written details of the route to be followed. These are to allow participants to navigate in the unlikely event that their map is lost or can't be used and to reinforce effective navigation during expeditions.

e. Identify escape routes:

For each leg there needs to be one or more identified escape routes as a precaution against extreme weather, becoming lost or in the event of an emergency. All DofE groups should also plan alternative poor weather routes to allow them the possibility of continuing their journey on a safer, low level (lower risk) expedition route.

f. Produce route details:

General information like the team name, participants' names and emergency contact numbers should be added and then several copies made. It is these copies, along with a route map which are used in the notification process. Route outlines/maps are traditionally tracing overlays on to 1:50 000 scale maps (rather than 1:25 000 to make them manageable). More commonly now, they are either drawn onto laminated maps or created electronically and emailed.

### **Route card Examples**

The following pages show various examples of route cards. These are just examples so please do not think that all route cards should be this way. Instead, agree with your supervisor and assessor which format is suitable.

The first example is of a FCH/ Bronze DofE award. You will notice that the comments contain direction suitable for this level. I.e. North/ South – East. You would be expected to detail exact bearings for Discovery, Dofe Silver and Gold.

Also 'escape points' have their post codes added. This is for ambulance and emergency drivers to locate them. You cannot presume everyone understands OS grid references.

We have also some standard abbreviations such as fpx for footpath cross roads, b/w =bridle way, cp = checkpoint,

Each step of the path is on it's own line – you could use it as a tick list.

Please look at all the examples and discuss what you like about some and not others.

**BRONZE DAY 2. Sunday - Circular route South of Hope Hill - Clockwise**

Day (auto)	Sunday
Date:	26-May-13
Day No.:	3
Distance:	13.6 km

Start Time:	08:00
Walk Spd:	2.5 km/h
Mag Var:	3 deg
Wiggle%:	0 %

Climb Rate:	10 m/min
Descent Rate:	10 m/min
Start Elevation:	0 m
Vert Drop time?	v

Team Name: 1st Abbeywood BPSA	
1 John	5 George
2 Brenden	6 AJ
3 Alex	7 James
4 Oliver	

Weather:
0800
1200
1400
1800

Contact details	
Supervisor:	Kieran McDonnell
Mobile:	
Assessor:	Jay Dodson
Mobile:	

Note 'alt' + 'enter' for new line

Check Pt	From	To	Dir	Bearing	Dist (km)	Check Pt	To	Route Description / Escape Route (Note 'alt' + 'enter' for new line)	Acc Dist(M)	Acc Dist (A)	T4Flat	Alt	T4Alt	T4Leg	E.T.A.	Rest?	E.T.D.	
1	TQ 638	640	N	129	1.7	2	TQ 649	632	Hopehill to Harvel Exit Camp via east exit into woods SE 500m to Heron Hill Lane (cross bridal way) S 50m to road corner E 80m to fp X SE on fp 400m, to FP crossroads (across open field to corner of house gardens) S (left fp) 100m to Havel House Farm CP2 is where FP meets road at Havel house farm CP2 as ref: Escape: back to Hopehill campsite POST CODE: DA13 0D	1.6	1.7	00:40	0	00:00	08:40	00:10	08:50	
2	TQ 648	650	N	179	2.1	3	TQ 650	618	Harvel to houses near Whitehorse Wood SW 260m, on road, around bend to 'Upper Harvel' SE 600m, on FP to road (past Croft view on LHS) SW 100m on road, to sports ground S 200m across sports ground to whiteshorse wood SW 300m through whithorse wood to road CP3 is the road corner meets whitehorse wood Escape: Sports Ground Building POST CODE:	3.6	3.8	00:50	0	00:00	00:50	09:41	00:10	09:51
4	TQ 656	621	SW	71	1.9	5	TQ 621	627	church (LHS). W 1.5k on FP until road (Church with spirer RHS) CP is where FP meets road. Escape: Telephone Box at Fairseat (POST CODE:	10.4	10.9	00:45	0	00:00	00:45	13:01	00:10	13:11
5	TQ 621	627	SW	54	2.7	6	TQ 638	641	Stanstead to Hodstall St NE 100m passing Y jct until FP straight ahead (School MEML on LHS) NE 700m to road. E across road back on to FP 350m until FPx continue NE up FP until road. CP6 is where fp meets road Escape: Horns Lodge POST CODE:	13	13.6	01:04	0	00:00	01:04	14:16	00:10	14:26
6	TQ 638	641	SW	54	2.7	7	TQ 638	641	Hodstall St to Hopehill Camp site E 50m on road, turn left on road 100m then E 50m on road, turn left on road at 100m ,take 3rd FP. NE 1km on FP (zigzag) (hollywell park farm LHS) until X roads. N 20m up road until FP RHS NE 400m until fp X take the E FP for 200m, follow FP N for 200m, follow FP east 100m until main road. S 200m to campsite (FINISH) Escape: Hopehill campsite POST CODE: DA13 0D	13	13.6	01:04	0	00:00	01:04	14:16	00:10	14:26

13.6 km Total Dist
--------------------------

05:26	00:00	05:26	01:00	06:26
Tot Time(hrs)Tot Rest				



# Route card

O.S. Sheet 51 Group D of E. Gold Date 4/10/02 Time out: 10.00 Finish time: 16.00

Leg	From	To	Bearing (mag)	Distance (km)	Height (m)		Time allowed for:			Total time:	ETA	Description	Escape route
					Gained	Lost	Distance	Height	Descent				
1	NW 615249	617255	N	0.6	40		9	4		13	10.13	Glenbeich Lodge Track	Return
2	617255	606277	320°	2.7	400		38	40	10	88	11.41	2nd stream, then ridge → S71	Return
3	606277	595286	318°	1.6	110		24	11	5	40	12.21	NW → S68	Return
4	595286	592276	218° → Lochan	1.2	50	10	18	5		23	12.44		S → Track
5	592276	577277	W	1.5	115	60	23	12	1	40	14.00	→ Meall Buidhe summit	W → Road
6	577277	576284	NW	1	44	50	15	6		21	14.21	Ridge → shoulder then N → summit	NW → Track
7	576284	583305	N → NE	2.3	0	395	35		10	45	15.06	To Forest Track	N → Track then W
8	583305	583222	NE, SW, W	2.4	10		36	1	2	5	15.50	Track → Road	Finish Route
9												(Beinn Leobhainn)	
10													
11													
12													

It gets dark at: 19.00

Central contact name: Jan Peter Phone number: 01234 567890

Variations on Naismith's rule. →

Walking rate: (horizontal)	Fast 5km/hr	+	Uphill rate in metres/hr:	Fast 900m/hr = 15 m. in 1 min
	Average 4km/hr		Average 600m/hr = 10m. in 1 min	
	Slow 3km/hr		Slow 300m/hr = 10m. in 2 min	
Highlight rates used	Extra slow 2km/hr			

Steep descents: Add 1 min for every steep descent of 10m

Total distance: 13.3 km Total height gain: 670m

Party member names: Steve Long, Mike Turner, Neil Johnson, Martin Chester, Louise Thomas

Special notes: Minibus 3. Midge repellent.

*(Handwritten signature and initials)*

DUKE OF EDINBURGH'S AWARD		QUEENS ROAD BAPTIST CHURCH D OF E GROUP COVENTRY						DAY	DATE	START TIME
ROUTE CARD							2	22nd July '06	9:00	
Place with Grid Reference	Direction of Bearing as Required	Distance in km	Time estimated	Height climbed metres	Extra Time Estimated	Time for Stops, Meals, etc	Time per Leg	Time at End of Leg	Escape in Emergency to:	
Campsite - Hafod Wen 730,355	300	2.50	0:50	0	0:00:00	0:10	1:00	10:00	Trawsfynydd	
Trk nr river junction 691,331	210	4.20	1:24	0	0:00:00	0:10	1:34	11:34	688 336, Rd	
FP/Rd Junction 688,336	340	0.60	0:12	50	0:05:00	0:00	0:17	11:51	688 336, Rd	
FP Junction in Valley 666,283	210	7.40	2:28	100	0:10:00	1:00	3:38	15:29	668 336, Rd or 684 303, Car Park	
Track-FP Junction 672,299	30	1.90	0:38	0	0:00:00	0:00	0:38	16:07	664 303, Car Park	
Campsite - Cwm Bychan 646,315	310	3.40	1:08	0	0:00:00	0:10	1:18	17:25	646 315, Cwm Bychan	
<b>TOTALS FOR DAY</b>		20.00	6:40:00	150.00	0:15:00	1:30:00	8:25:00	17:25		
Supervisor's Name, Location, Phone: <b>Ben Harris XXXXXX</b> or <b>Graham Parsons XXXXXXXX</b>										
<b>Group Members</b>		Mickey Mouse	Fred Flintstone	Donald Duck						
Tom (the Cat)	Jerry (the Mouse)		6	7						

- NOTES**
- 1 Use one Route Card for each day
  - 2 See attached for Foul Weather Deviation plans
  - 3 Plan to stop for rests and meals, probably at end of legs. Estimate times for these, exploring, etc and include in route card.
  - 4 Escape Route - insert only those places to which an escape may be attempted from a hazard or emergency.

**Route Card – Peak District Challenge**

**Start / Finish Point – Grid Ref : 175/688 Sheldon Villages Hall**

<b>Leg No</b>	<b>From</b>	<b>To</b>	<b>Grid Ref</b>	<b>Distance (Approx)</b>	<b>Remarks</b>
<b>1</b>	Sheldon	Over Haddon	204/ 665	3 miles 5 K M	Go past magic mine - Left over Kirk Dale - Past Melbourne Farm and on to Over Haddon
<b>2</b>	Over Haddon	Friden	173/ 608	6 miles 9 K M	F/P past Meadow Place Grange to Lombdale Hall - into Bradford Dale - F/P to Storrill Grange - road into Long Dale turn Right - join road & follow to car park
<b>3</b>	Friden	Car Park Disused Railway	150/ 612	2 miles 3.5 K M	Midshires way - past Brundcliffe - track on Left - cross A515 - track then F/P to car park
<b>4</b>	Car Park Disused Railway	Harrington	128/ 605	2 miles 3.5 K M	F/P to Heathcote - road into Harrington
<b>5</b>	Harrington	Earl Sterndale	098/ 664	5 miles 7.5 K M	Road to Bank Top FM - past Cardlow to Hildbury - F/P to Crowdecote - F/P to Earl Sterndale
<b>6</b>	Earl Sterndale	Flagg	136/ 683	3 miles 5 K M	F/P to Wheelton Trees - road to Harflow Town - F/P to Pomerooy - cross A515 - F/P to Flagg
<b>7</b>	Flagg	Sheldon	175/ 688	3 miles 5 F M	Road to Town End - F/P past High Lane - cross road - F/P then road to Sheldon

### 13. Check Point Discipline & Dead Letter Drops

On expedition, you will need to meet the assessor on the route. This can be ANYWHERE on the route (as recorded on the routecard) and not just at the end of legs.

Therefore, it is very important to keep to the agreed route and times. It is OK to be late but you must never, (unless there is an emergency), leave a point before the route card indicated departure time.

The reason for this is that the assessor or supervisor may need to meet you at that point.

The assessor / supervisor will wait at a checkpoint until you arrive. They are there to make sure you are OK. If not they will arrange for someone to go back on your route and find you.

A 'Dead letter drop' is a card that is left at all check points by the expedition group if they do not meet the assessor or supervisor in person. They will have key details on like:

- Your group name
- The time
- The date
- What is going well
- What could be better
- When this card can be disposed of

+

It is traditional to leave the assessor a sweet or to tell a joke with the card !

The card needs to be put into a plastic bag and tied/attached to a man made feature. For example a gate, post, fence. Make sure it is in an obvious place. Do not tie them to tree branches as they will never get seen.

Here is an example of a dead letter drop.

 	1st ABBEY WOOD BPSA SCOUTS
	Team name: <b>SWORD</b>
This leaflet is an important part of the safety procedures for young People taking part in the Duke of Edinburgh Award Expedition.	Place name: <b>LUDDESDOWN</b>
	TIME: <b>10.30</b>
Please leave it here until the end of: (write the day/date/month/year)	Grid Ref: <b>TQ660663</b>
<b>SATURDAY 25th MAY 2013</b>	What are you enjoying? <b>Views, singing, seeing animals up Close</b>
If found after that, please dispose of tidily.	Anything you need to tell us? <b>No but the rucksacks are heavy</b>
Thank you	

## **14. Food, Menus and Cooking equipment**

In this section we will consider:

- Nutrition
  - Daily requirements food and water (calories & volumes)
  - Types of food to take
  - Types of cookers
- 
- Nutrition – carbs, protein etc
  - Exped food – ideally low weight (dehydrated)
  - Food psychology – importance of a good meal, improves moral & balance of weight over taste !!
- 
- Calories spread over the day, 20% breakfast, 50% during hike, 30% evening
  - What if you eat too much at lunch time????? You might struggle to finish - so snack until you get to camp.

The actual cooking:

- Different types of stove (Jet boil, Trangia (pronounced trawn-yah), anything small and portable. Whatever you like cooking on.
- safety procedures and precautions especially handling fuels.
- Cooking simple meals under camp conditions
- Try cooking all different types of food. For this level you should be able to get a lot of good expedition food from a supermarket.

### **Expedition/ Hiking/ DofE Food**

Choosing the right amount and right kind of food will make a huge difference to how successful and enjoyable your DofE expedition will be.

Choosing foods you like makes all the difference. The physiology of food should not be underestimated. If it is cold and wet ? A nice hot dinner will get the team spirits up again.

For this reason it is worth balancing weight against taste. Generally taste is heavier but if it gives you that mental boost after a tough day then it may be worth it.

#### **14.1 Expected calorie consumption**

From [www.indieoutdoors.co.uk/dofe/food\\_for\\_dofe\\_expeditions.html](http://www.indieoutdoors.co.uk/dofe/food_for_dofe_expeditions.html)

You will need to consume probably 2-3 litres of water – depending on weather conditions, body build etc. If the weather is expected to be very hot, please see if the assessor and supervisor can provide extra water at checkpoints.

You will need to consume at least much more calories on expedition than you would do normally. You need to aim for at least 2000-3000 (depending on your size, muscle build etc). This is no small task.

On packaging, calories are written as kcal / 100g which means how many thousands of calories there are per 100g. Therefore:

1 kcal = 1 calorie

4.2 kJ = 1 calorie

## **14.2 Balance of food groups**

The food groups are fat, protein, carbohydrate (including sugar) and (technically speaking) alcohol. Obviously we only need to bring the first three with us on our expedition.

Fat has the highest energy/calorie value per 100g of any food type but you can't survive purely on fat and it doesn't taste that great on its own (would you eat just butter?). Includes cheese, nuts and meat.

Proteins have a similar number of calories per 100g to carbohydrates but half as many as fat. Some people seem to need more protein than others: if an egg or piece of cheese fills you up more than a bowl of cereal then you are probably one of these people and should take more protein with you.

Carbohydrates are normally the main body of any meal. They give the fastest energy release. Includes rice, pasta, potatoes and bread.

## **14.3 Menu planning**

Here are our suggestions for good things to include in your meals. Then I have included a list of things to avoid because they can cause specific problems when camping.

### **Breakfast**

Food type & Suggestions

#### **Porridge oats**

Must be instant, not whole oats. Mix 50g oats, 50g powdered milk and 15g sugar in a small sandwich or freezer bag for storage in your rucksack. In the morning put 350ml water into a cooking pan, empty the contents of the bag into it, stirring until everything goes thick. You could also use a pre-prepared sachet of instant oats like 'Oat So Simple' but these do not contain powdered milk.

#### **Cereal**

Choose the highest calorie per 100g cereal you can find (as long as you like it). Most cereals are around 340 - 380 calories per 100g but Crunchy Nut Cornflakes are over 400 and crunchy muesli type cereals (anything with 'cluster's in the name) are around 480 calories per 100g! Mix 50g cereal

#### **Top Tip:**

**Sugar burns on pans very easily and makes cleaning them very difficult. To prevent it damaging expensive expedition equipment, cook all your ingredients without sugar. Remove / turn off gas, add the sugar at the last minute and stir in. This will ensure your Skip's blood pressure is kept at a safe level when you return the cooking pots.**

and 50g powdered milk in a seal-able bag. To eat empty into a bowl and then pour cold water over and stir.

### **Beans**

Not very high in calories and the tins weigh quite a bit but if a hot plate of beans makes you feel better in the morning then give it a go. You can get half size cans as well and ones with sausages in have a higher calorie content.

### **Cereal bars**

Not very satisfying but some people like to get away early in the morning without doing any cooking or washing up so cereal bars might do at a pinch. Get the highest calories per 100g.

### **Soups**

Instant soup sachets with pitta bread to dunk.

Hot chocolate added with some food. The extra calories and warm you up nicely on a cold morning.

### **Frankfurters**

Sausages which are smoked or cooked or dried already and which have not been taken out of their packets should be fine but if they are supposed to be kept in a fridge eat them the first day.

### **Hard boiled eggs**

If you make yourself some hard boiled eggs before leaving home they should be ok for at least 24hrs but don't keep them too hot for too long and try not to get them squashed...

### **Lunch**

Think of lunch in two parts: carbohydrate and fat/protein. Therefore you need something with bread / starch and something tasty / with protein.

### **Carbohydrates**

Bread things: pitta bread, oat cakes, naan bread, fajitas can be warmed up on top of a pan lid whilst you cook something else underneath and can't get squashed as they already flat (actually oat cakes will get a bit squashed but thats ok)

### **Rice, pasta, mash, noodles**

If you want a hot lunch treat read the dinner section below for suggestions. However, a large hot lunch will mean you struggling to get going again. Always better to eat light at lunch time.

### **Protein**

Meat Dried meats like pepperami, chorizo, beef jerky etc are all great sources of protein and fat. Anything out of the fridge section of the supermarket is a bad idea as it could go bad and give you food poisoning. The only exception might be frankfurters. If you eat them early in the expedition as they are salty and pasteurised so should keep depending on weather conditions. Once open they are not safe however so eat them all !

### **Fish**

Tins of sardines, mackerel, tuna in sauce, oil or brine. Yummy and nutritious and can be eaten straight out of the tin saving on washing up.

## **Cheese**

Most cheese will go sweaty and fairly gross in your rucksack. Stick to things which are individually wrapped like baby bel, dairy lea or cheese in a tube.

## **Dinner, supper, tea, whatever you want to call it...**

Again choose a carbohydrate and a protein and go for the highest calories and the shortest cooking times.

## **Carbohydrates**

### **Risotto**

My other favourite carb along with instant mash. Get sachets of risotto which are already cooked with various flavours in like Uncle Ben's Risotto. You can even boil the sachet in water without opening it then eat it out of the sachet when hot. Just pour two or three dessert spoons of boiling water into the sachet after opening and give it a stir. No washing up! Yeah!

### **Rice**

Never bring normal rice as everything takes twice as long to cook on a camping stove as on a stove at home and rice already takes 20mins so thats 40mins.... nightmare. 10min boil in the bag rice is OK but the best kind is the pre-cooked type in a sachet such as Tilda Steamed Rice or Uncle Ben's Express.

### **Pasta and noodles**

Just like rice never bring any kind of pasta which takes 10 or more minutes to cook normally. Only use quick cook types or instant meal types (like Pasta n'Sauce). Noodles tend to be faster than pasta and some pre-cooked types are virtually instant- you just stir them around in a little boiling water to heat them and eat.

### **Instant mash potato**

One of my favourite camping foods. Incredibly easy to cook, hardly uses any water so takes seconds to boil enough and is warm and filling.

### **Couscous**

Easy peasy to make- get the precooked one, it should say something like: 'leave for 3mins' not: 'leave for 10mins'. Measure how much couscous you are going to use (50g per person) and add the same volume of boiling water. About half a mug of each per person. Then just wait a few minutes.

## **Protein**

### **Tuna sachets**

You can now get cooked tuna steaks in sauce or oil in a plastic sachet. You can heat them up by boiling the unopened sachet in water. 116 kcal/100g

### **Beanfeast**

A vegetarian dried chili con carne like stuff which you add water to and heat up. 315 kcal/100g

## **Salami**

Dried sausage like salami or chorizo can be sliced and thrown into pasta, risotto or eaten on its own. It has a very high protein and calorie content. 407 kcal/100g.

## **Smoked Sausage**

Mattesons' Smoked Pork Sausage is salty enough and has been smoked enough to preserve it and so as long as you don't open the packet it will keep in your bag for the duration of your expedition. 310kcal/100g

## **Cheese**

Some cheeses will go slimy in your bag, especially on a hot day. There are a few which will be fine-camembert, brie, babybel and feta. Camembert and brie will go very soft and runny but that's how you're supposed to eat them anyway... About 290-320 kcal/100g.

## **Sauces**

Add a sauce if you like. Buy sauces in sachets instead of glass jars and try to get ones in single serving sizes so you don't have to reseal the packet. Most sauces are under 100 kcal/100g but satay sauce is nearly 200 kcal/100g because it contains peanuts and black bean sauce 136 kcal/100g.

## **Snacks**

**Snacks** are very important if you want to increase your calorie count from around 1,500 to over 2,000. Snacks tend to have very high calories per 100g. Conversely this is why you should avoid snacks if you are on a diet! Remember you are not on a diet when on your DofE, even if you do want to lose weight, don't try to do so on your expedition!

## **Snacks**

### **Nuts and trail mix**

Nuts are very high in fat and therefore very high in calories. You can mix them with dried fruits to make 'trail mix'. You can put whatever you want in your trail mix and put it in a resealable plastic bag. You can have it in your pocket ready for your hand to dip in whenever you feel a drop in energy.

### **Super Trail Mix**

When people do a serious expedition to the South Pole or something they do not eat breakfast or lunch and instead just make a big bag or special trail mix which they keep eating all day. It contains broken up pieces of high calorie chocolate bars, flapjacks, chunks of cheese, salami and nuts. You could try making your own one or if the idea of eating salami and chocolate at the same time puts you off, try making a savoury and sweet one separately.

## **Chocolate**

Although on hot days chocolate might melt a little its got masses of calories in a small compact size, doesn't go off and almost everyone likes it. The highest calorie bars are Kit Kat Chunky, Mars Bar, Snickers, Cadbury's Dairy Milk. Basically anything 'chunky'.

## **Sweets**

Traditional hard boiled sweets are great as they contain plenty of calories and you can suck them as you walk. Starburst etc are also a good idea. Take 'em if you like 'em.

### **Peanuts**

Either in your trail mix or on their own peanuts contain lots of calories and don't go off. Check that no-one in your team has a peanut allergy though as its one of the worst allergies!

### **Pepperami**

Yum yum. Don't get anything sausage like which is supposed to be kept in the fridge though.

### **Drinks**

Generally speaking you will run out of any drink you are carrying at the end of the first day and need to refill. As you can't buy anything on your expedition its going to be water you're drinking. If you do take any drinks for your first day don't bring anything with caffeine in as it is a diuretic (makes you wee) and so you will become dehydrated.

The only other drink worth bringing is hot chocolate. It weighs hardly anything and gives you a sugar and calorie boost and makes you feel better either in the evening before bed or in the morning to wake you up. Get the single serving hot chocolate sachets. Make sure its not Cadbury's Options or Highlights as these are low-fat and low calorie versions. Yuck.

## **14.4 Bad Expedition Food**

...and the BAD List - llist of foods which are not very suitable to take on an Expedition.

### **Bacon**

Personally I don't recommend bacon as it makes a mess of your cooking pan, you won't have oil to fry it in so it will stick and you have to use it all in one go or it will go rancid. Some people just ignore all my advice though...

### **Sausages**

Fresh ones are a no-no as they will go off and you could get nasty food poisoning.

### **Eggs**

You could take raw eggs in a tupperware dish and then try to fry them but where would you get the oil from?

### **Mushrooms, tomatoes etc**

Fresh stuff will not last, could get squashed and contains nowhere near enough calories to get you going. Tinned things weigh too much and don't contain enough calories to make up for this.

### **Fresh fruit**

Fine for your first day but don't bring more than you need for day one or it will get bruised and go nasty in your rucksack.

### Crisps

Although they are high in calories they are bulky due to needing to have air added to the package to stop them getting crushed so they take up way too much room in your rucksack. A bag of Walker's crisps has the same calories per 100g as a chocolate bar but takes up twice as much room at least and contains fewer grams.

### Pot noodle

Very bulky as the packaging contains lots of empty space inside for the water. Not very high in calories or indeed much of anything else either...

## **14.5 When and how much to eat**

Have you noticed that you feel tired after eating a big meal usually with potatoes, pasta or rice?

This is due to your blood sugar levels going through a rapid change of levels.

For an expedition it is better to snack regularly rather than stopping for an hour to have a large meal.

When you arrive at camp you can then fill up on the complex carbs of rice & pasta.

## **14.6 Example of food you can purchase at a supermarket**

The next few pages are pictures of packets that you can purchase from your local supermarket. I have also included their nutrition information section. As an exercise work out a menu for a 3 day expedition.

ADD SOME MORE EXAMPLES UNPROCESSED/ LESS PROCESSED FOOD THAT YOU CAN EASILY TAKE ON EXPEDITION. EG NUTS, RICE, BEEF JERKY, PITA BREAD – ANY MORE ?

GET THEIR NUTRITION VALUE TABLE AS WELL !



TYPICAL VALUES	PER 100g AS PREPARED	PER ½ PACKET AS PREPARED
Energy	584kJ/138kcal	1095kJ/259kcal
Protein	5.7g	10.6g
Carbohydrate	23.3g	43.7g
of which sugars	2.4g	4.4g
Fat	2.3g	4.3g
of which saturates	1.2g	2.2g
Fibre	0.8g	1.5g
Sodium	0.20g	0.38g
Salt equivalent	0.51g	0.96g



Typical Values (Prepared as per instructions without butter or oil)	Per 100g	Per Serving (130g)
Energy	622kJ (147kcal)	812kJ (192kcal)
Protein	4.8g	6.2g
Carbohydrate	28.0g	36.4g
of which sugars	1.8g	2.3g
Fat	1.3g	1.7g
of which saturates	0.4g	0.5g
Fibre	2.4g	3.1g
Sodium	0.35g (350mg)	0.46g (460mg)

PER SERVING: 192 CALORIES  
1.7g FAT 1.15g SALT  
THIS SACHET SERVES 2



Typical values	per 100g
Energy	1196kJ/289kcal
Protein	16.7g
Carbohydrate	0.9g
of which sugars	0.8g
Fat	24.1g
of which saturates	11.0g
Fibre	0.6g
Sodium	1.0g
Salt equivalent	2.5g



Informazioni nutrizionali medie per 100g/Nutrition Information - Typical values per 100g/Informations nutritionnelles moyennes pour 100g/Nutritionele informatie per 100g/Θρεμτικά στοιχεία κατά μέσο όρο ανά 100 g/Næringsindhold pr. 100g/Ravintoarvo per 100g/Näringsvärde per 100 g:	
Valore energetico/Energy/Valore energetico/Valeur énergétique/Energetische waarde/Ενέργεια/Energi/Energiaa/Energi:	1003 kJ/241 kcal
Proteine/Protein/Protéines/Eiwitten/Πρωτεΐνες/Protein/Proteïnia/Protein:	16,0 g
Carboidrati/Carbohydrate/Carboidrati/Glucides/Koolhydraten/Υδατάνθρακες/Kulhydrat/Hiihihydraatteja/Kolhydrater:	6,0 g
Grassi/Fat/Grassi/Lipides/Vetten/Λιπαρές ύλες/Fedt/Rasvaa/Fett	17,0 g



see list of ingredients.

Nutrition Information	Typical values per 100g cooked**
Energy	523kJ/124kcal
Protein	6.0g
Carbohydrate	21.3g
of which sugars	1.7g
Fat	1.3g
of which saturates	0.6g
Fibre	1.4g
Sodium	0.2g
Salt equivalent	0.5g



see below. Produced in Germany using EU

Nutrition Information	Typical values per 100g
Energy	1762kJ/426kcal
Protein	22.5g
Carbohydrate	1.0g
Fat	36.5g

\* For more information visit [www.lidl.co.uk](http://www.lidl.co.uk) or [www.lidl.ie](http://www.lidl.ie)



NUTRITION INFORMATION		
TYPICAL VALUES	PER 100g AS PREPARED	PER 1/2 PACKET AS PREPARED
Energy	569kJ/134kcal	931kJ/221kcal
Protein	3.2g	5.3g
Carbohydrate	28.3g	46.7g
of which sugars	0.9g	1.4g
Fat	0.7g	1.1g
of which saturates	0.2g	0.3g
Fibre	1.0g	0.5g
Sodium	0.31g	1.3g
Salt equivalent	0.80g	



Typical values	per 100g microwaved**	per half pack 125g microwaved**	%GDA
Energy	640kJ/151kcal	800kJ/189kcal	9%
Protein	3.2g	4.0g	8%
Carbohydrate	32.0g	40.0g	15%
of which sugars	0.3g	0.4g	<1%
Fat	1.0g	1.3g	2%
of which saturates	0.4g	0.5g	3%
Fibre	0.6g	0.8g	3%
Sodium	0.19g	0.24g	10%
Salt equivalent	0.48g	0.6g	10%

GDA = of an adult's guideline daily amount

\* For more information visit [www.lidl.co.uk](http://www.lidl.co.uk) or [www.lidl.ie](http://www.lidl.ie)



TYPICAL VALUES	PER 100g AS PREPARED	PER PORTION AS PREPARED
Energy	152kJ/36kcal	385kJ/91kcal
Protein	0.7g	1.8g
Carbohydrate	6.5g	16.5g
of which sugars	1.9g	4.8g
Fat	0.7g	1.7g
of which saturates	0.3g	0.9g
Fibre	0.5g	1.3g
Sodium	0.20g	0.51g
Salt equivalent	0.50g	1.28g



see list of ingredients.

Nutrition Information	Typical values per 100g cooked**
Energy	519kJ/123kcal
Protein	3.5g
Carbohydrate	24.4g
of which sugars	1.8g
Fat	0.9g
of which saturates	0.2g
Fibre	1.4g
Sodium	0.23g
Salt equivalent	0.58g



see list of ingredients.

Nutrition Information	Typical values per 100g cooked**
Energy	522kJ/123kcal
Protein	3.2g
Carbohydrate	25.1g
of which sugars	0.6g
Fat	0.6g
of which saturates	0.2g
Fibre	2.3g
Sodium	0.28g
Salt equivalent	0.7g



see list of ingredients.

Nutrition Information	Typical values per 100g cooked**
Energy	507kJ/120kcal
Protein	5.0g
Carbohydrate	19.5g
of which sugars	2.3g
Fat	2.0g
of which saturates	1.0g
Fibre	2.0g
Sodium	0.2g
Salt equivalent	0.5g

## 14.7 Cooking Equipment

There are a number of different types of stoves and lamps on the market today, using a variety of different fuels. The four main types of stove in use today are:

- Trangia – uses methalated spirits as fuel or canister gas (pans pack neatly with stove).
- Petrol Stove (perhaps a little more trickier to manage the fuel)
- Gas Stove (various designs but becoming the popular choice)
- Solid Fuel or Hexamine Stove (nice but heating power can be limited)

Think about storing the fuel you will use. If meths or petrol contaminates your food you cannot eat it. Gas, with the self sealing screw top, is becoming popular. The canisters can get punctured in your rucksack and the emitting gas will freeze anything around it. Remember to take at least 2 cans of fuel and put them in different rucksacks.

As part of your training you must be become trained in how to use these stoves properly.

**DO NOT USE INSIDE A TENT AS THE CARBON MONOXIDE GIVEN OFF CAN EASILY KILL YOU.**



## **15. Weather and Weather Forecasting**

Most of the images and diagrams in this section have been copied from various web sites and other sources. Where known I have stated it. If not, then I cannot remember where it is from. If anyone finds the source please tell me and I will add it.

We could spend a week discussing weather and forecasting but for this level we just need to know a few things.

- Understand where most of UK weather systems come from
- Where to obtain decent forecasts for your area
- Understanding those reports for your trip
- Knowing when to check for updates

Hot air/ Cold air movements

High/ Low pressures

Air masses

Clouds – how formed

Clouds – how named

Weather maps – isobars

Jet stream

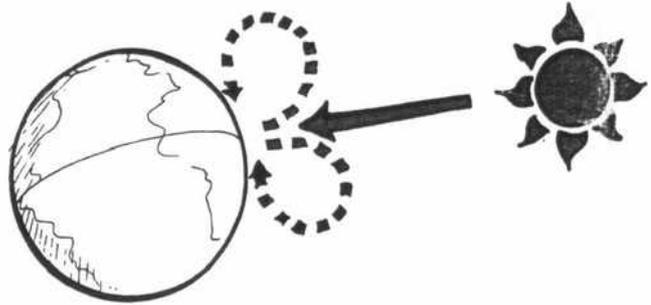
Forecasts on TV, radio, web - Met Offi

**15.1 How Weather is created**

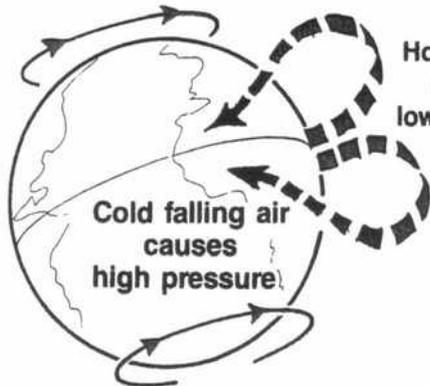
**WEATHER SIMPLIFIED**



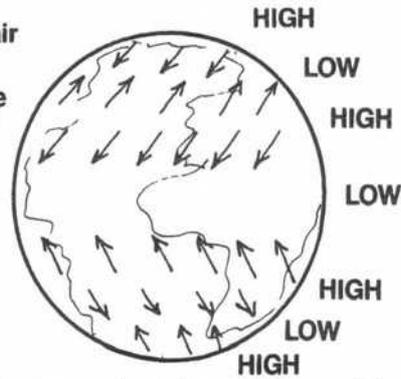
COLD AIR FALLS TO TAKE ITS PLACE



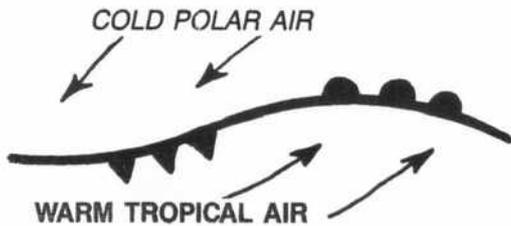
When the sun heats the earth, the hot air rises and it is replaced by cold air. Just like a garden bonfire.



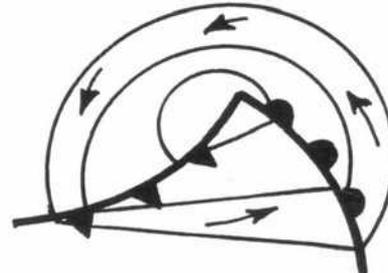
The spin of the earth disturbs this air movement and forms winds.



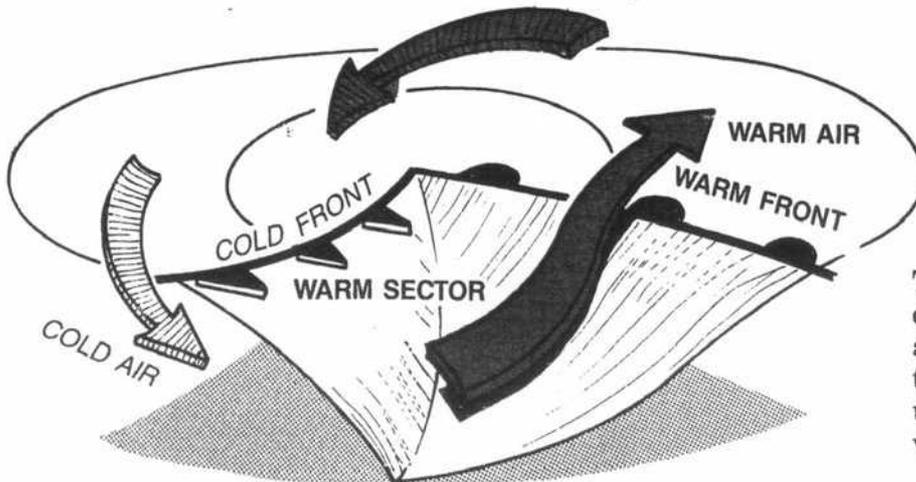
The uneven heating of the world cause bands of different pressure and winds.



When warm and cold air systems meet they interact and form an eddy.

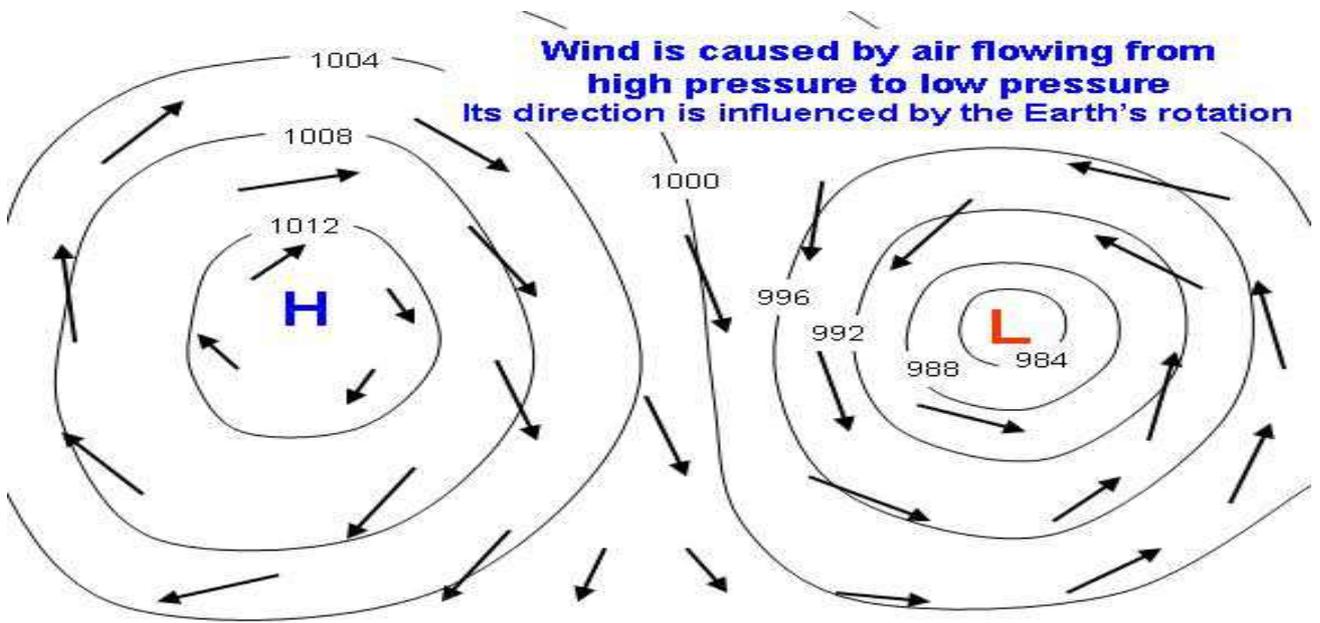
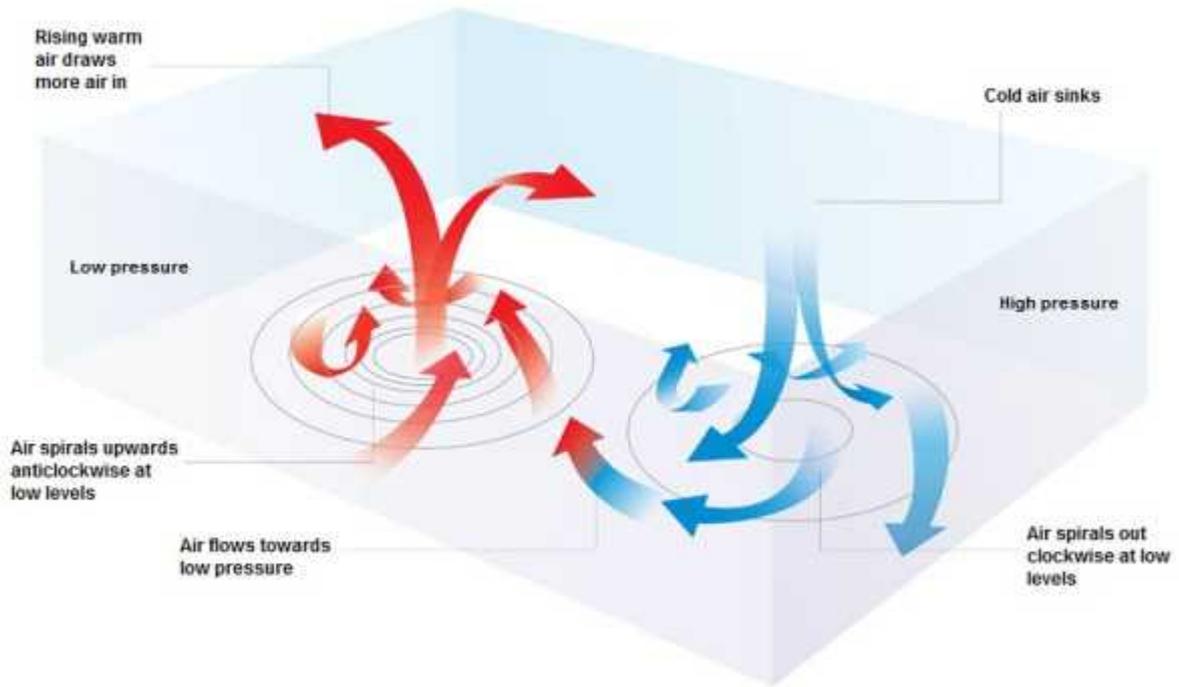


This swirls anti clockwise into a low pressure system called a *cyclone*, *depression* or *low*.

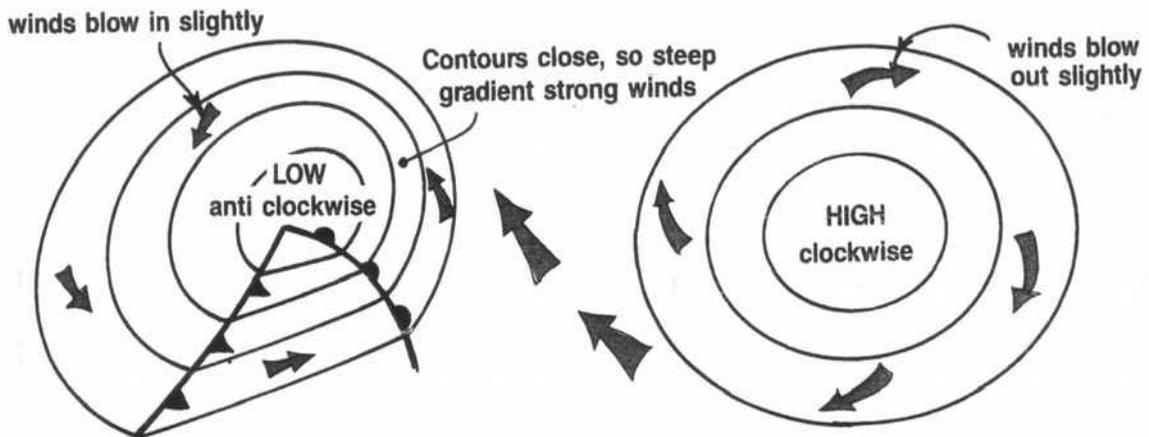
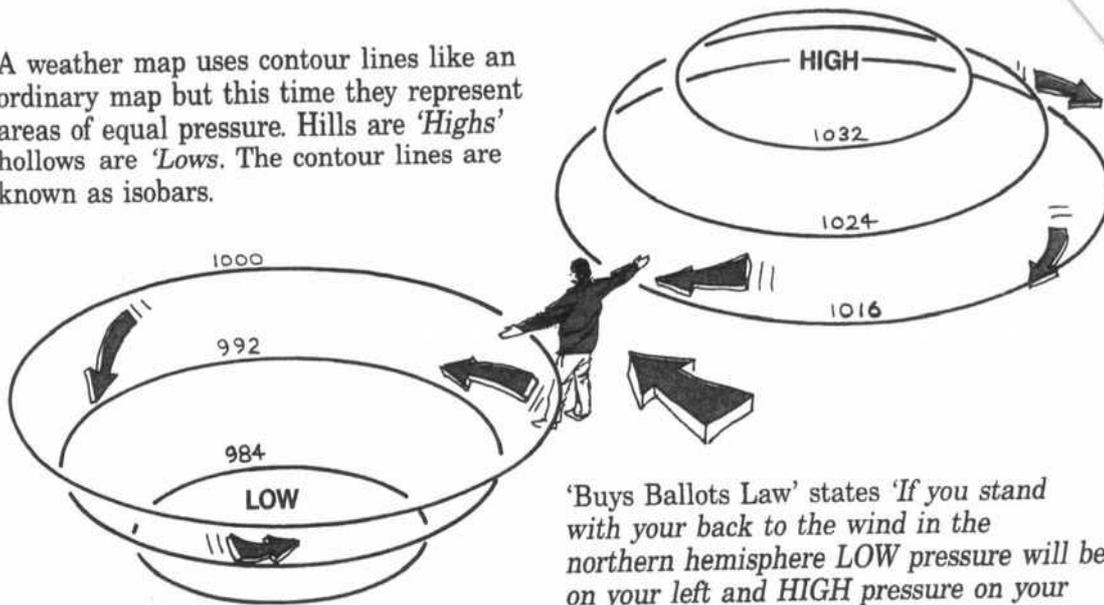


The warm air rises over the cold air and the cold air then tries to undercut the warm air.

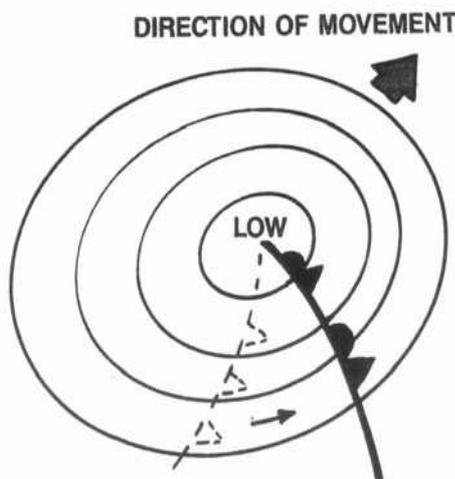
Wind pressure flows from HIGH pressure to LOW pressure.



A weather map uses contour lines like an ordinary map but this time they represent areas of equal pressure. Hills are 'Highs' hollows are 'Lows'. The contour lines are known as isobars.



Wind always blows from *HIGH* pressure to *LOW* pressure. (Like a leaking tyre) and the steeper the pressure gradient the stronger the wind.



A Low can travel at speeds of 60 knots or more directed by the strong winds above it. But after several days it slows down and the cold front gradually catches up the warm one. When they join it is known as an *OCCLUDED FRONT*.

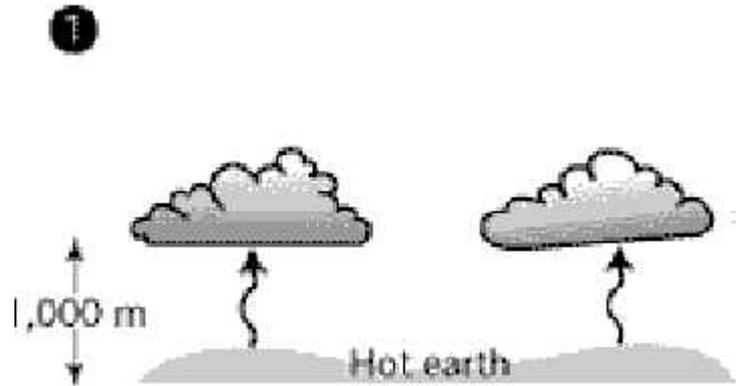
## 15.2 Forming Clouds

As clouds are a major indicator of forecasting weather, we will discuss them in some depth.

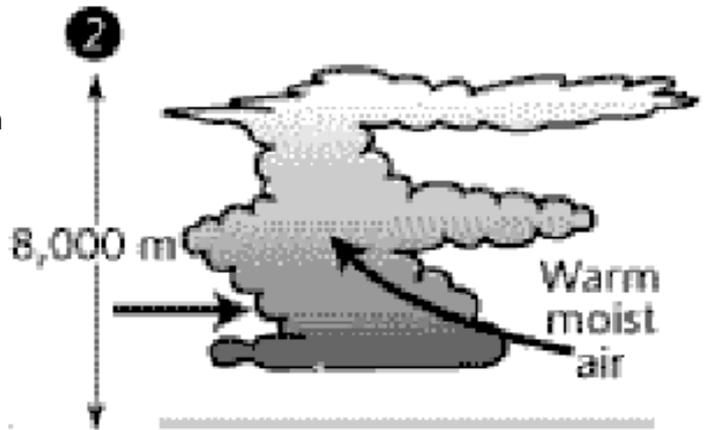
There are 4 main ways in which air rises to form cloud

1. Rapid local ascent when heated air at the earth's surface rises in the form of thermal currents (convection).

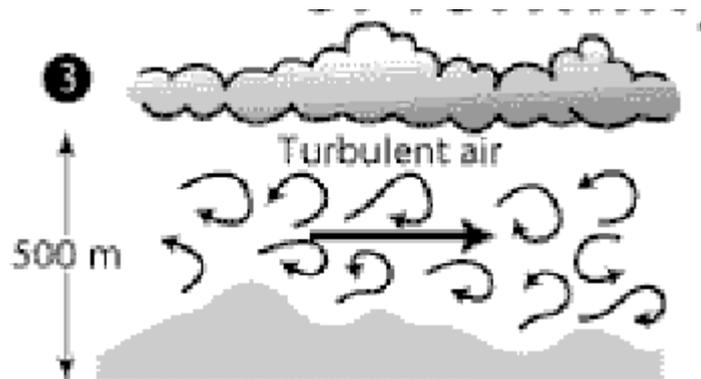
formed



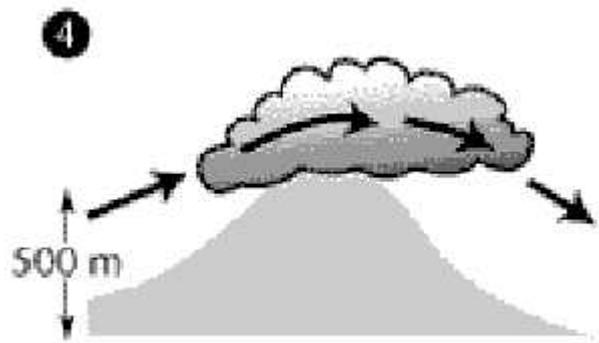
2. Slow, widespread, mass ascent where warm moist air is undercut by cold air (the barrier between the warm and cold air is called a 'front').



3. Upward motion associated with turbulent eddies resulting from the frictional effect of the earth's surface.



4. Air forced to rise over a barrier of mountains or hills. The first of these tends to produce cumulus-type clouds, whereas the next two usually produce layered clouds. The last can produce either cumulus-type cloud or layered cloud depending upon the state of the atmosphere. The range of ways in which clouds can be formed and the variable nature of the atmosphere give rise to the enormous variety of shapes, sizes and textures of clouds.



### **15.3 Cloud type names and description**

We will consider ten main types of cloud that are common in the UK. They can be separated into three broad categories according to the height: high clouds, medium clouds and low clouds.

The common British cloud names are a mixture of 5 Latin words:

- Cirrus (tufts of hair)
- Cumulus (heap)
- Stratus (layer)
- Nimbus (rain bearing)
- Alto (although in Latin 'Alto' means high, in weather terms it means 'medium' height)

How the cloud name is constructed:

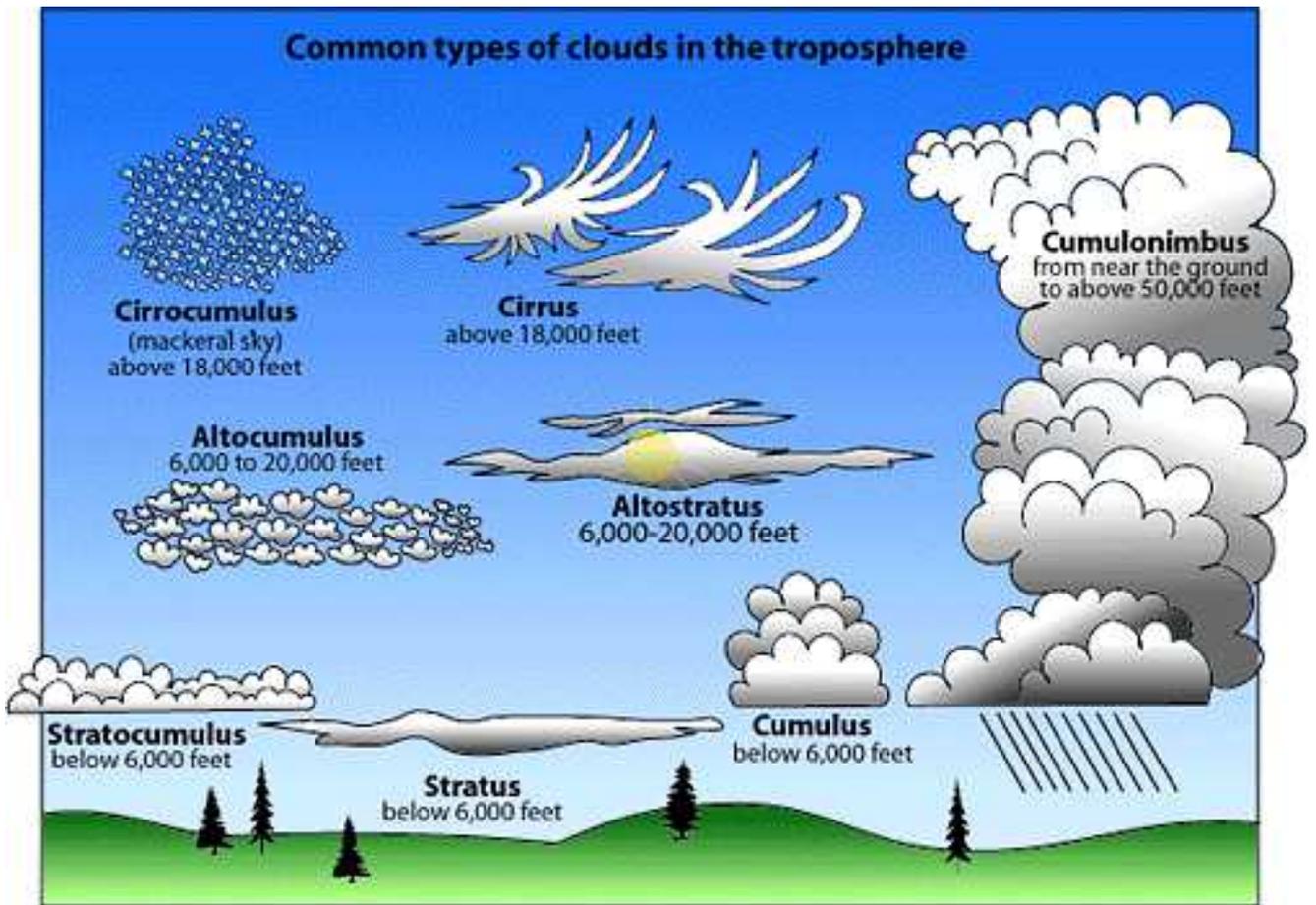
Cirrus (tuft of hair)	Cumulus (heap)	Stratus (layer)	Nimbus (Rain bearing)	Alto (medium height)
--------------------------	-------------------	--------------------	--------------------------	-------------------------

HIGH ALTITUDE 5,500-14,000 meters					
Cirrus		(white filaments)			
	✓				
Cirrocumulus		(small rippled elements)			
	✓	✓			
Cirrostratus		(transparent sheet, often with halo)			
	✓		✓		

Cirrus (tuft of hair)	Cumulus (heap)	Stratus (layer)	Nimbus (Rain bearing)	Alto (medium height)
--------------------------	-------------------	--------------------	--------------------------	-------------------------

MEDIUM ALTITUDE 2,000-7,000 meters					
<b>Alto cumulus</b> (layered, rippled elements, generally white with some shading)					
		✓			✓
<b>Altostratus</b> (thin layer, grey, allows sun to appear as if through ground glass)					
			✓		✓
<b>Nimbostratus</b> (thick layer, low base, dark, rain or snow may fall from it)					
			✓	✓	

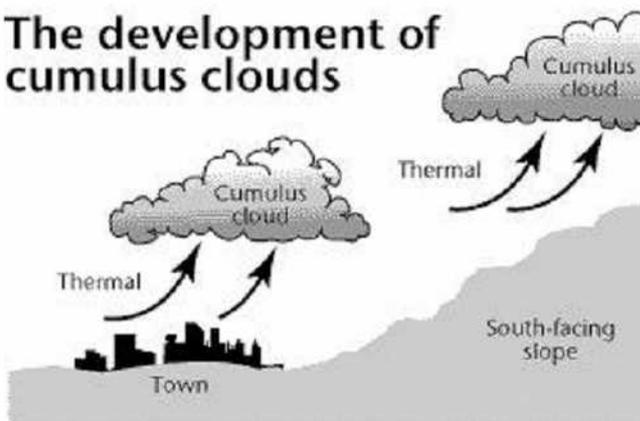
		Cirrus (tuft of hair)	Cumulus (heap)	Stratus (layer)	Nimbus (Rain bearing)	Alto (medium height)
<b>LOW ALTITUDE</b>		Up to 2000 meters				
<b>Stratocumulus</b>	(layered, series of rounded rolls, generally white with some shading)					
			✓	✓		
<b>Stratus</b>	(layered, uniform base, grey)					
				✓		
<b>Cumulus</b>	(individual cells, vertical rolls or towers, flat base)					
			✓			
<b>Cumulonimbus</b>	(large cauliflower-shaped towers, often 'anvil tops', sometimes giving thunderstorms or showers of rain or snow)					
			✓		✓	



#### 15.4 Detailed cloud formations

##### Cumulus

#### The development of cumulus clouds



*Cumulus clouds form due to thermals caused by a town or a south-facing slope*

Cumulus clouds are often said to look like lumps of cotton wool. With a stiff breeze, they march steadily across the sky; their speed of movement gives a clue to their low altitude. They occasionally produce light showers of rain or snow.

Typically, the base of cumulus clouds will be about 2,000 feet (600 metres) above ground in winter, and perhaps 4,000 feet (1,200 metres) or more on a summer afternoon.

Individual clouds are often short-lived, lasting only about 15 minutes.

They tend to form as the ground heats up during the day and become less frequent as the sun's heat wanes towards evening. The cause of small cumulus clouds is usually convection.

Heat from the sun warms the ground, which in turn warms the air above. If a 'parcel' of warm air is less dense than the cooler air around it or above it, the 'parcel' of air starts to rise -this is known as a 'thermal'. As it rises it expands and cools, and, if cooled sufficiently, the water vapour condenses out as tiny cloud droplets. A cumulus cloud is born. The air within the cloud will continue to rise until it ceases to be buoyant. On some sunny days there is insufficient moisture or instability for moisture to form. In hilly regions, a high, south-facing slope acts as a good source of thermals, and therefore of cumulus.

Occasionally, a power station or factory will produce a cloud of its own. When air rises in thermals there must be compensating downdraughts nearby. These create the clear areas between cumulus clouds and make it easier for glider pilots to find the thermals that they can use to gain height.

**Stratus**



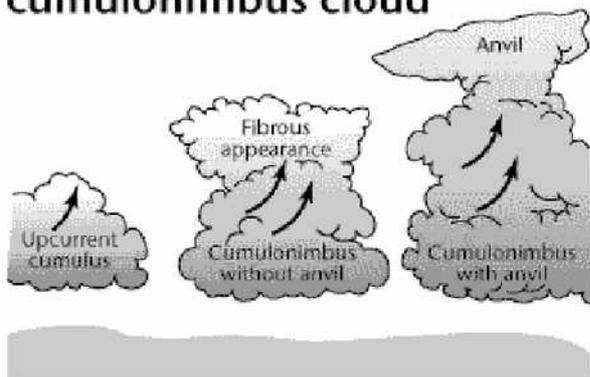
Stratus is a low-level layer cloud (not to be confused with altostratus and cirrostratus, which are much higher). In appearance, it is usually a featureless grey layer.

Sometimes, when a sheet of stratus is affecting an area, the cloud base will be right down to the ground and the visibility will be below fog limits. However, the usual base will be between the ground and 1,000 feet (300 metres), which means that hilltops may be obscured by cloud.

Sometimes stratus will produce drizzle, snow or snow grains, particularly over hills. Perhaps the most important indication of its low altitude is its apparent rapid movement across the sky in any wind stronger than a flat calm. For example, a stratus cloud at 500 feet (150 metres) moving at 20 miles per hour will appear to move much faster than altostratus with its base at 10,000 feet (3,000 metres) moving at 60 miles per hour.

An approximate guide to the height of stratus may be gained by measuring the relative humidity and subtracting it from 100. The resulting number gives some idea of the height of the low cloud in hundreds of feet. For example, 94% relative humidity would indicate that the stratus is about 600 feet (180 metres) above the ground. Inland, the base of any stratus will tend to lift slightly during the daytime and, in summer, will usually disperse completely unless associated with rain. On the coast, when a moist south - westerly airstream persists, there may be no such respite. The highest frequency of stratus occurs in the western parts of the British Isles where moist south-westerly airstreams are forced to rise over various ranges of hills.

**The life-cycle of a cumulonimbus cloud**



*The cumulonimbus cloud starts as a humble cumulus and, if the upcurrent is sufficiently powerful, will grow into a deep cumulonimbus before decaying*

On the coast, when a moist south - westerly airstream persists, there may be no such respite. The highest frequency of stratus occurs in the western parts of the British Isles where moist south-westerly airstreams are forced to rise over various ranges of hills.

**Cumulonimbus**

Just as cumulus is heaped cloud, so cumulonimbus is a heaped rain cloud (nimbus means rain). In many ways the rain-bearing variety can be considered as a bigger, better-organised version of the cumulus.

A cumulonimbus may be 10 km across and extend 10 km above the ground. This compares with a cumulus cloud which is typically a few hundred metres across and reaches a height of only a few kilometres. Instead of a ball of cotton wool, a cumulonimbus will resemble a huge cauliflower of sprouting towers and bulging turrets. But there is one important structural difference in that the uppermost levels of the cumulonimbus have turned to ice and become fibrous in appearance, whereas cumulus clouds are composed entirely of water droplets. This icy section at the top may flatten out into an 'anvil' shape when the cloud is fully developed. When it reaches this stage, the base is usually dark, with showers of rain, hail or snow falling. Ice or snow, however, will often melt before reaching the ground.

Often the showers are quite heavy for short periods. Also, lightning and thunder sometimes occur. Sometimes cumulonimbus will be 'embedded' or half hidden among other clouds. On other occasions they will be well separated and the 'anvil' may well be visible many miles away.

Cumulonimbus clouds may be seen at any time of the day, but are most common inland during the afternoon in spring and summer. At these times, convection is at its strongest and most organised. The lifetime of a cumulonimbus is usually less than one hour. There are exceptions though. The 'Hampstead storm' of 14 August 1975 was an example of a cumulonimbus cloud that managed to keep regenerating itself over one small area of London. About 170 mm of rain fell in three hours, causing severe flooding.

## Cirriform clouds



Cirriform clouds (i.e. clouds from the cirrus family) are found at high altitude, usually above 20,000 feet (6,000 metres).

They are composed of ice crystals. Three types of cloud make up the group: cirrus, cirrostratus and cirrocumulus. Cirrus itself is very common in the British Isles and throughout most of the world. It is thin, wispy and white in appearance, and its name, coming from the Latin word for 'tuft of hair', gives a good description

of the cloud.

Another name for the cloud, 'mares tails', also conjures up an accurate image. Cirrus may be hooked or straight depending on the airflow aloft. Sometimes it comes as a very dense patch which is left over from the 'anvil' cloud of a cumulonimbus that has disappeared. On other occasions, cirrus may be quite extensive when associated with a jet stream -the cloud can then be seen moving across the sky, despite its great altitude.

Aircraft condensation trails are a form of man-made cirrus. They can sometimes be seen in 'historical' films, to the delight of film buffs who enjoy spotting technical inaccuracies. Cirrostratus is a fairly uniform sheet of thin cloud through which the sun or moon can be seen. Sometimes, if the cloud is thin, a bright ring of light (called a halo) surrounds the sun or moon.

A layer of cirrostratus is often an indication of a deterioration in the weather. Cirrocumulus is often present in small amounts along with cirrus, but rarely does it dominate the sky. On those occasions when it is widespread, a beautiful spectacle is created, especially at sunset. The individual clouds appear very small -often tiny rows of roughly spherical pear-like cloud elements. Sometimes they occur in undulating patterns like tiny ripples.

## Stratocumulus and altocumulus

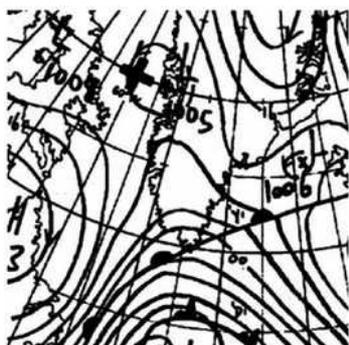


Stratocumulus clouds usually form between 1,000 and 6,500 feet (300 and 2,000 metres), whereas altocumulus clouds form between 6,500 and 23,000 feet (2,000 and 7,000 metres). Clouds at these levels are referred to as low cloud and medium cloud, respectively.

There is no great difference in the properties of stratocumulus and altocumulus, since both are composed of water droplets and are normally limited in vertical extent, so the distinction is rather an arbitrary one. Stratocumulus will often give a sheet of almost total cloud cover, with perhaps one or two breaks. The cloud elements are rounded and almost join up. Occasionally, the sheet is composed of a series of more or less parallel rolls, which often, but not always, lie 'across the wind'. Also, stratocumulus sometimes produces light falls of rain or snow. Altocumulus also provides a sort of dappled pattern, but, since it is at a greater altitude, the cloud elements look smaller. There are many variations on the theme, including altocumulus castellanus, which is like a vigorous medium-level cumulus (this type of cloud is sometimes an indication that thunderstorms will follow). Both stratocumulus and altocumulus are formed by weak convection currents, perhaps

triggered by turbulent airflows aloft. The convection affects a shallow zone because dry, stable air above the cloud sheet prevents further upward development. Sometimes there are huge sheets of stratocumulus covering thousands of square kilometres around the flanks of a high pressure system, especially over the oceans. The weather below such sheets tends to be dry, but it may be rather dull if the cloud is two or three thousand feet thick.

### 15.5 Interpreting weather maps - Isobars, Symbols



The lines shown on a weather map are isobars - they join points of equal atmospheric pressure. The pressure is measured by a barometer, with a correction then being made to give the equivalent pressure at sea level.

Meteorologists measure pressure in units of millibars (mb), though instruments sometimes give pressures in terms of inches of mercury. The term hectopascal (hPa) is often used instead of millibar, where 1 millibar equals 1 hectopascal. In the British Isles the average sea-level pressure is about 1013 mb (about 30 inches of mercury), and it is rare for pressure to rise above 1050 mb or fall below 950 mb.

Charts showing isobars are useful because they identify features such as anticyclones and ridges (areas of high pressure) and depressions and troughs (areas of low pressure), which are associated with particular kinds of weather. These features move in an essentially predictable way.

There are three important relationships between isobars and winds.

- The closer the isobars, the stronger the wind.
- The wind blows almost parallel to the isobars.
- The direction of the wind is such that if you stand with your back to the wind in the northern hemisphere, the pressure is lower on the left than on the right.

#### Wind Speed & Direction

The direction given for the wind refers to the direction from which it comes. For example, a westerly wind is blowing from the west towards the east.

Measurements of wind strength are made at 10 metres (33 feet) above the ground. A specified height has to be used because the wind speed decreases towards the ground. In this country winds are measured in knots (nautical miles per hour).

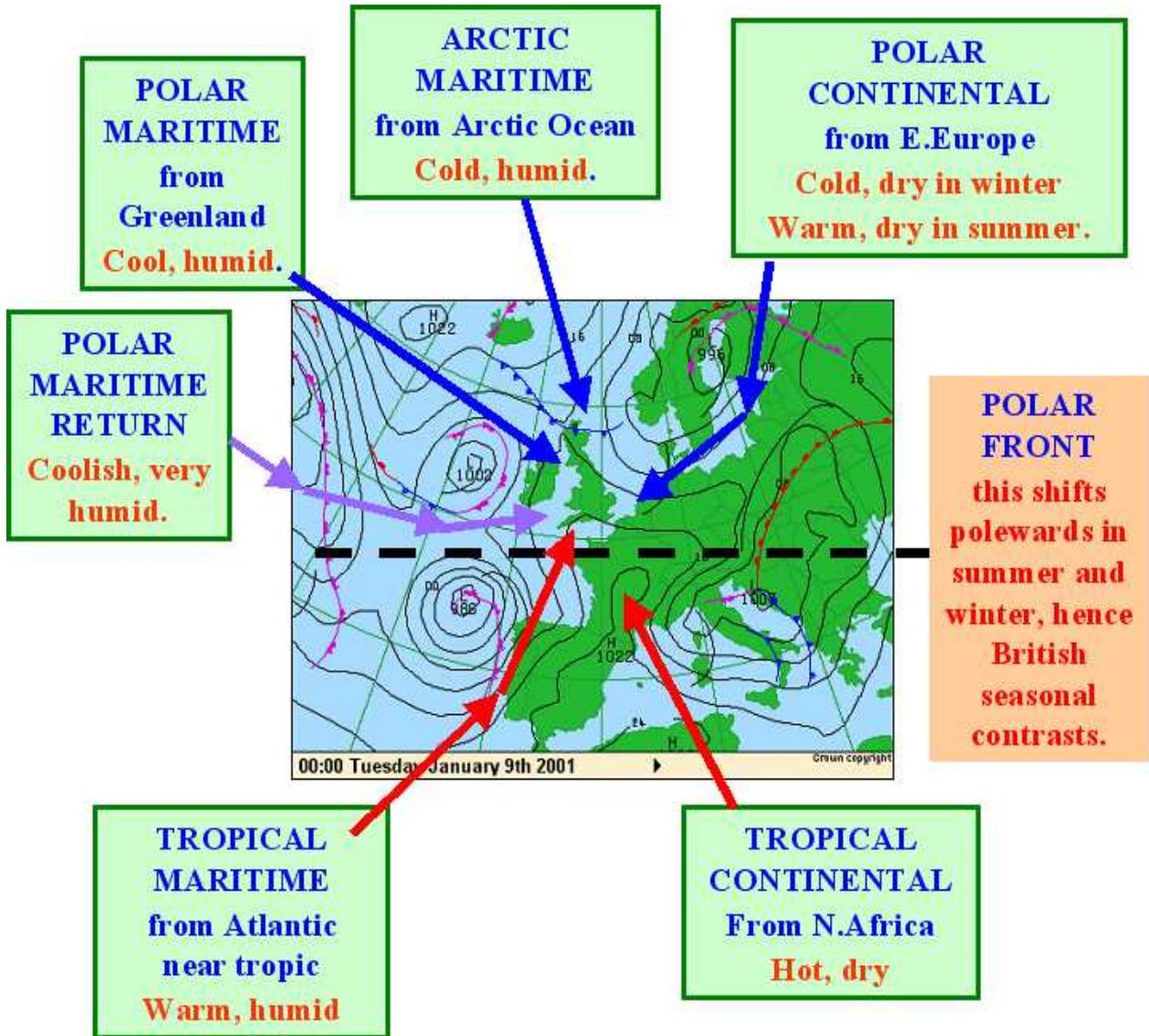
However, forecast winds are often given in miles per hour (where 1 knot is equivalent to 1.15 m.p.h.) or in terms of the Beaufort Scale.

Where there are rapid variations in the wind these are referred to as 'gusts'. Gusts are higher inland than over the sea or windward coasts, although the average wind speeds tend to be lower inland. Typically, gusts can be 60% higher than the mean speed, although in the middle of cities this can reach 100%. Northerly winds tend to be gustier than southerly ones.

Weather maps use symbols. Here is a table of the common ones used. Thankfully, TV weather broadcasts use easier symbols but I have included this as you may see it on the notice board of a remote Youth Hostel as you are about to leave for a days hiking.

## 15.6 Common Air masses over the UK

'Air mass' is the name given to very large section of air with the same temperature and humidity (water content). There are six main ones that hit the UK.

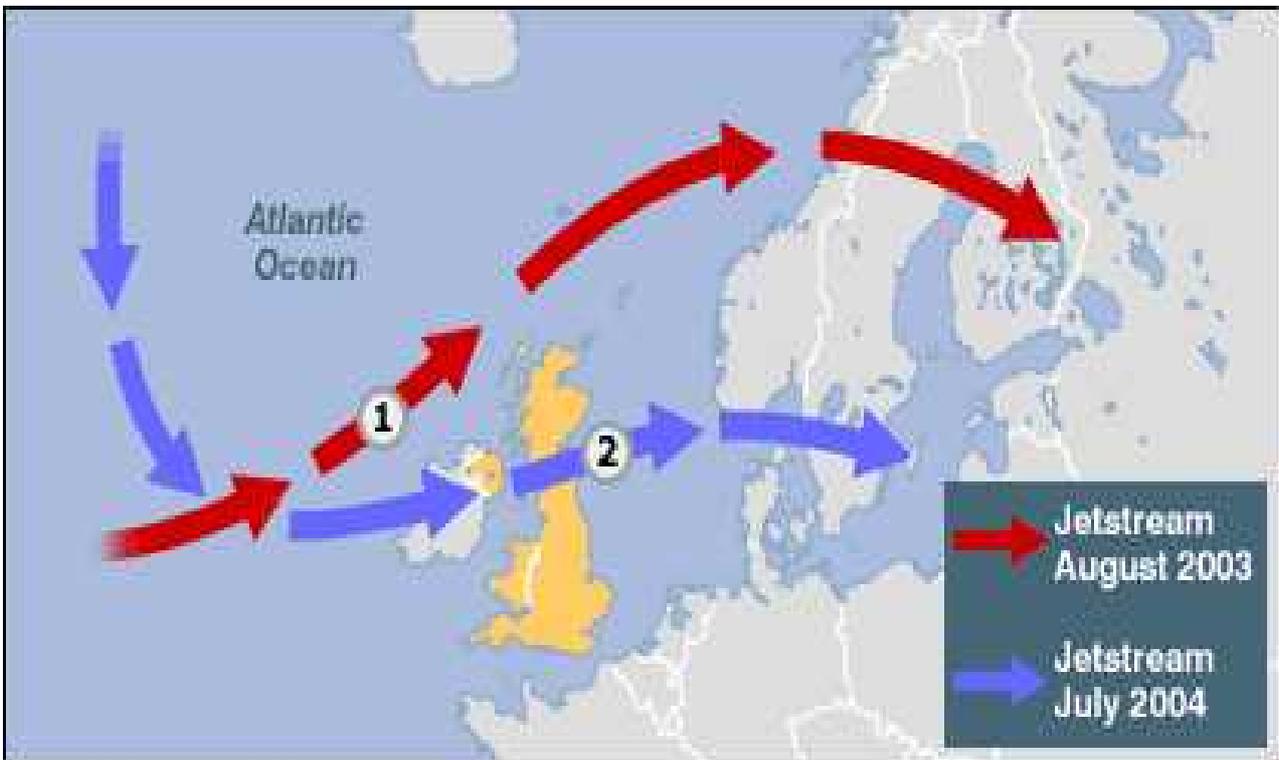
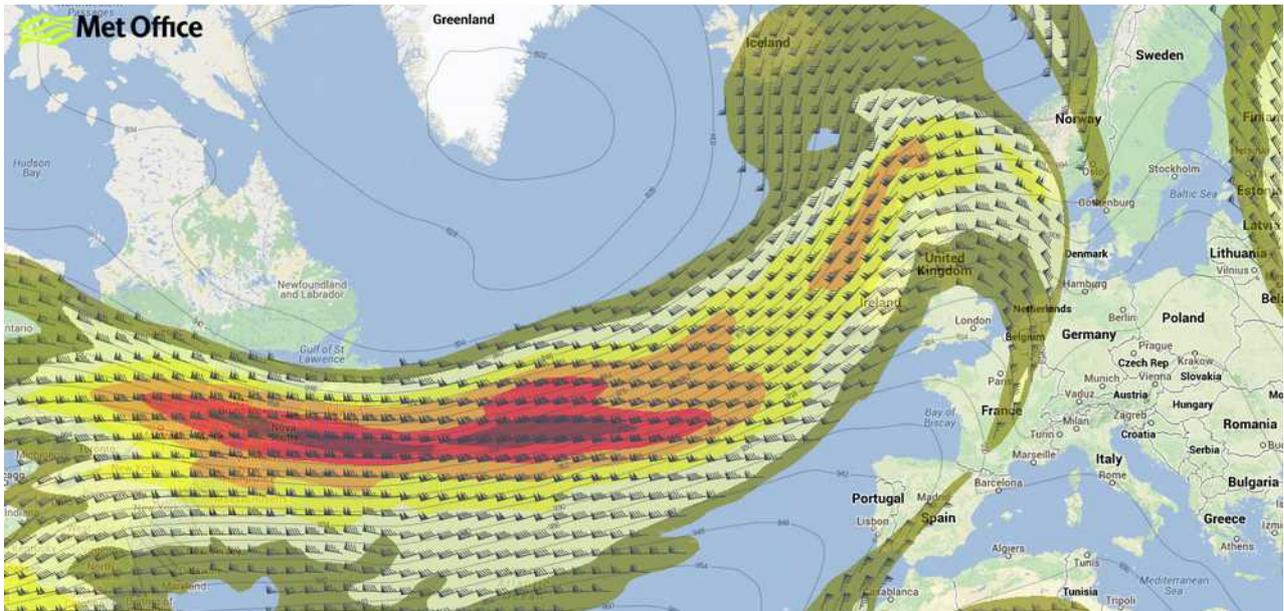


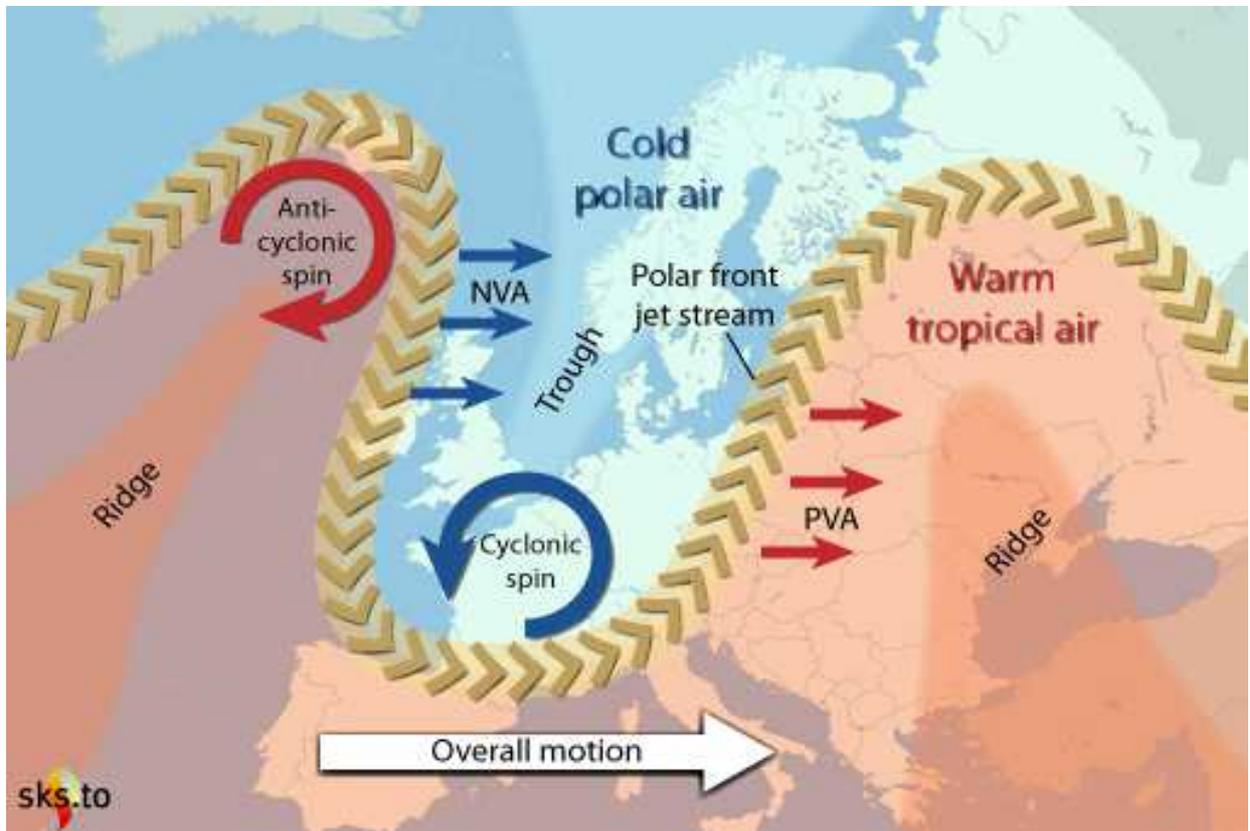
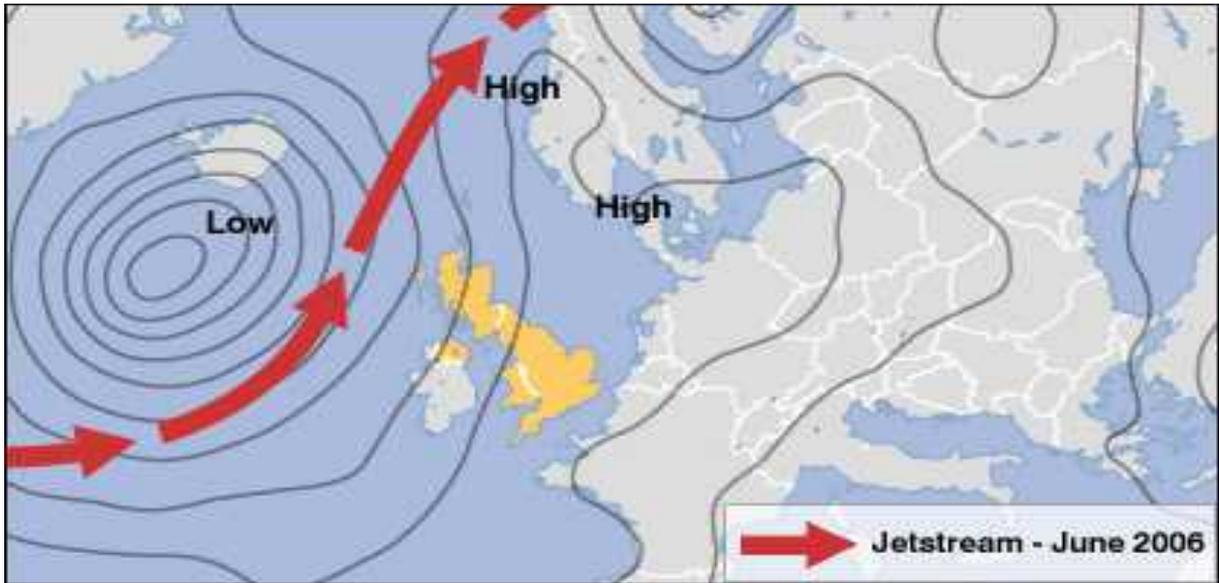
An air masses are generally named from where it originates and what it passes over. So 'Polar Maritime Return' is from the polar cap, over the water, and bends out west before coming to us (returns ) so picks up more moisture. Simples !

## 15.7 Jet Stream

The Jet stream is a very fast flowing stream of air (upto 200miles per hour) that has a major influence on what weather the UK receives. The stream moves around but normally flows above to the north of the UK. It acts as a barrier between the cold weather of the Polar cap and warm weather of the equator. Therefore in its normal position, the UK receives wet warm air.

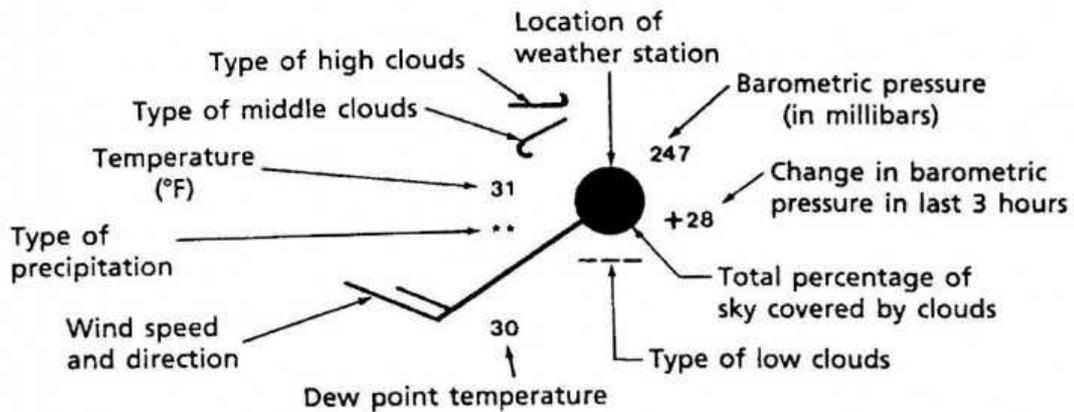
The diagram below shows how the jet stream is pulling storms direct from the US to the UK. The Jet stream was so powerful that the storms had no chance of dispersing in the Atlantic Sea.





15.8 Weather maps symbols

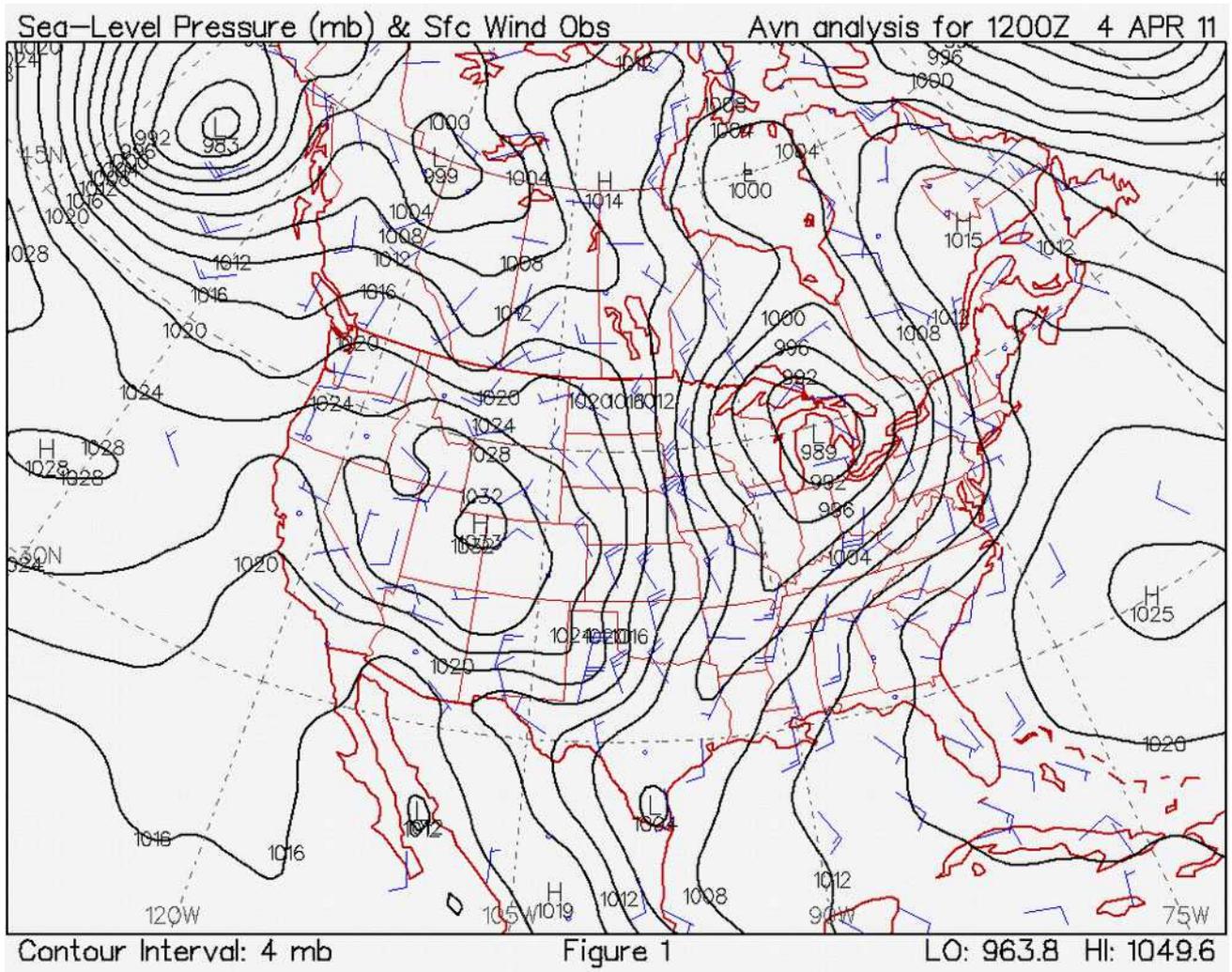
**Weather Map Symbols (Simplified Version)**



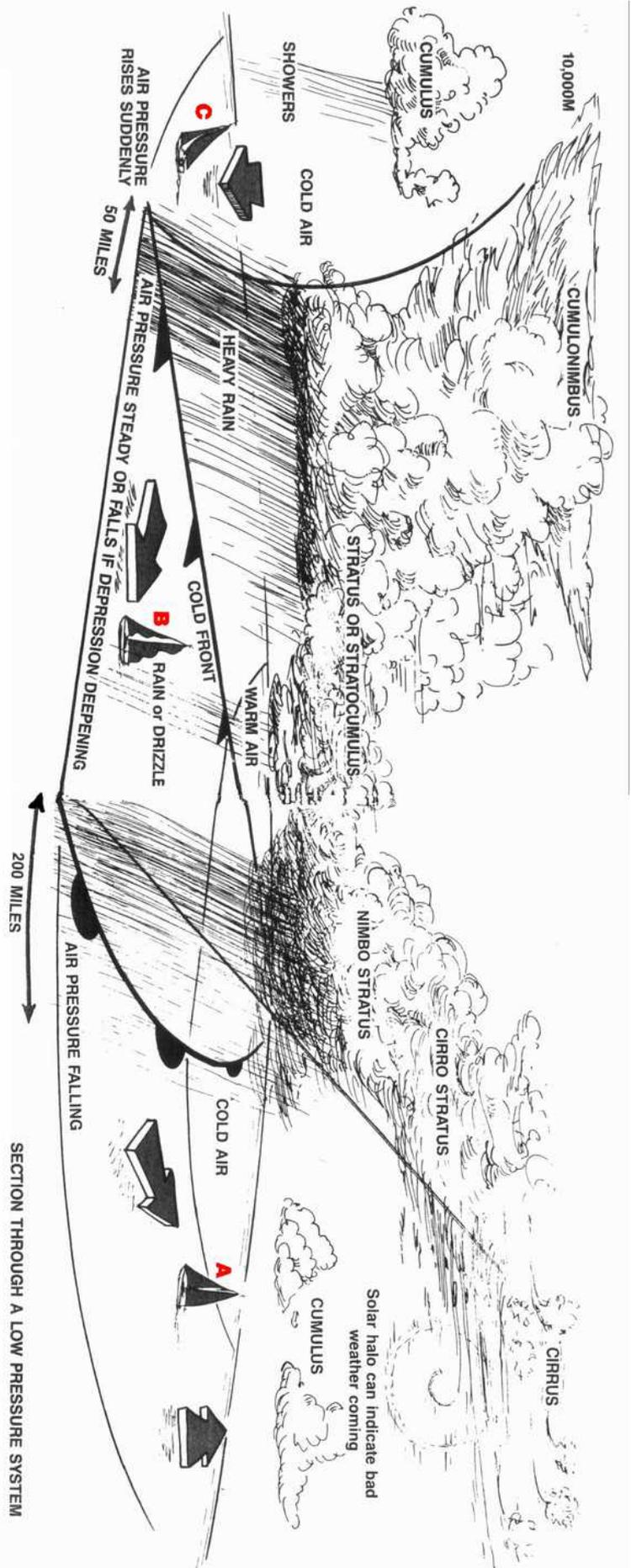
**SYMBOLS USED IN PLOTTING REPORT**

Precipitation	Wind speed and direction	Sky coverage	Some types of high clouds
Fog	0 calm	No cover	Scattered cirrus
Snow	1-2 knots	1/10 or less	Dense cirrus in patches
Rain	3-7 knots	2/10 to 3/10	Veil of cirrus covering entire sky
Thunderstorm	8-12 knots	4/10	Cirrus not covering entire sky
Drizzle	13-17 knots	1/2	
Showers	18-22 knots	6/10	
	23-27 knots	7/10	
	48-52 knots	Overcast with openings	
	1 knot = 1.852 km/h	Complete overcast	

Some types of middle clouds	Some types of low clouds	Fronts and pressure systems
Thin altostratus layer	Cumulus of fair weather	(H) or High Center of high or low pressure system
Thick altostratus layer	Stratocumulus	Cold front
Thin altostratus in patches	Fractocumulus of bad weather	Warm front
Thin altostratus in bands	Stratus of fair weather	Occluded front
		Stationary front



As an exercise, see how many symbols from the previous page you can see on this weather map.



If a low pressure system was passing over us at A, we should experience

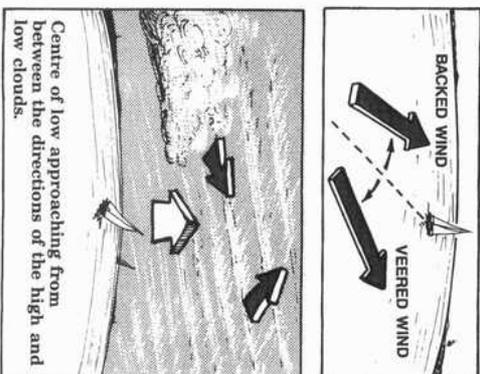
- Wind increasing and backing as the warm front approaches.
  - cloud building and thickening
  - rain becoming heavier
  - air pressure falling
  - visibility deteriorating
- As the warm front passes**
- nimbostratus clouds
  - rain turns to drizzle
  - air pressure steady
  - wind veers
  - visibility poor

In the warm sector at B

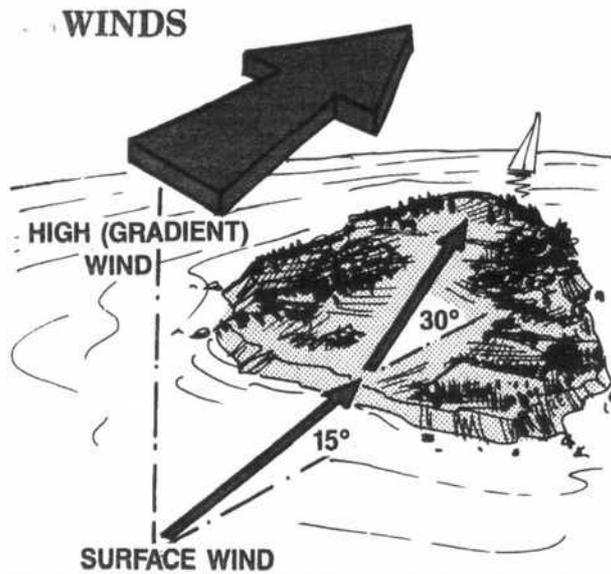
- the wind and pressure is steady with occasional showers and poor visibility. As the cold front passes:-
- wind very squally and veers
- cloud thickens
- heavy rain
- air pressure falls near front then suddenly rises
- visibility poor

Behind the cold front at C

- strong and gusty wind
- clear skies for a while
- air pressure steady
- visibility good

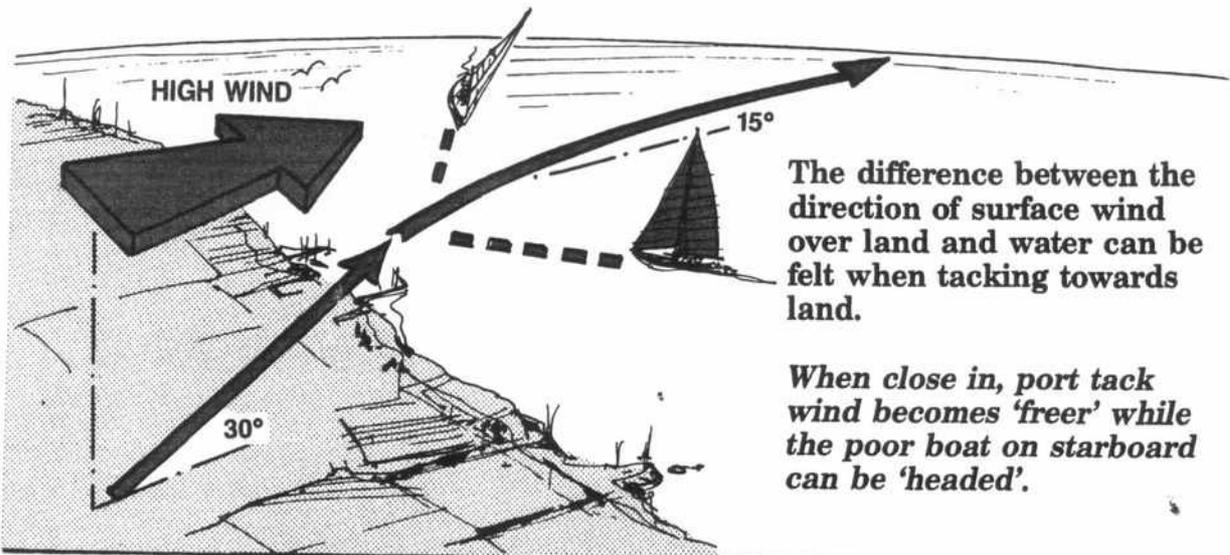


**15.9 Winds and weather direction**



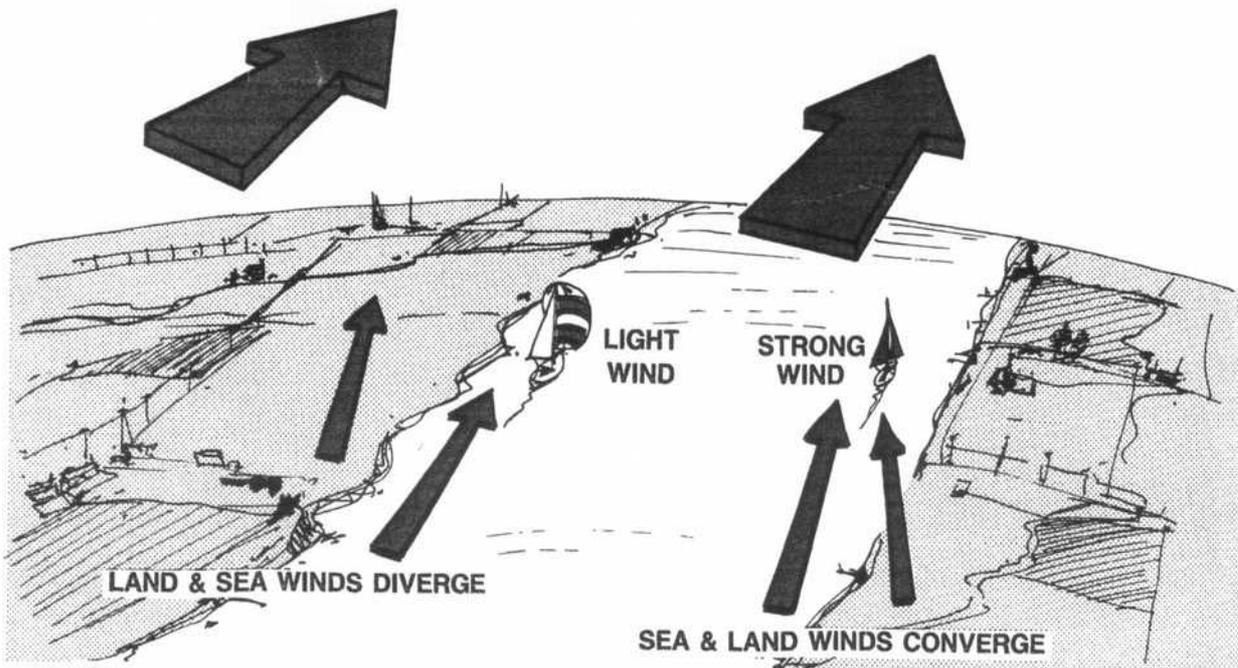
Winds blowing at sea level are not only slowed by the friction of the earth's surface, but change direction as well.

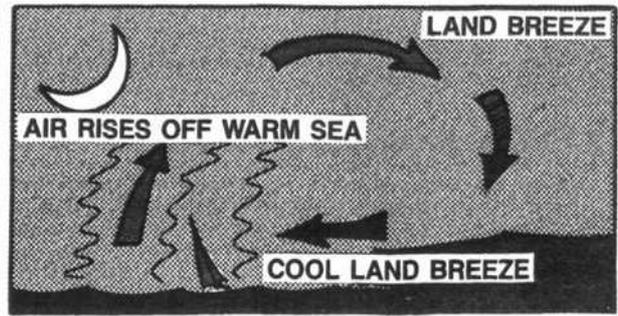
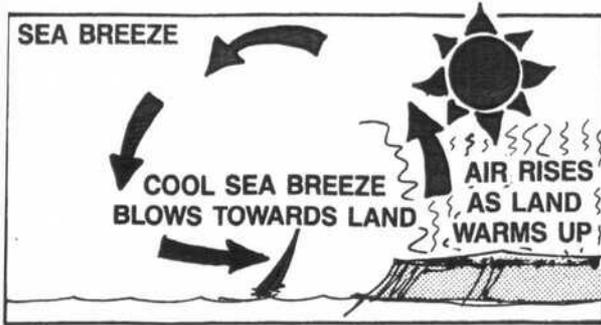
*Over water the wind is 'backed' by about 15° from the high wind direction, while over land the difference can be as much as 30°-40°.*



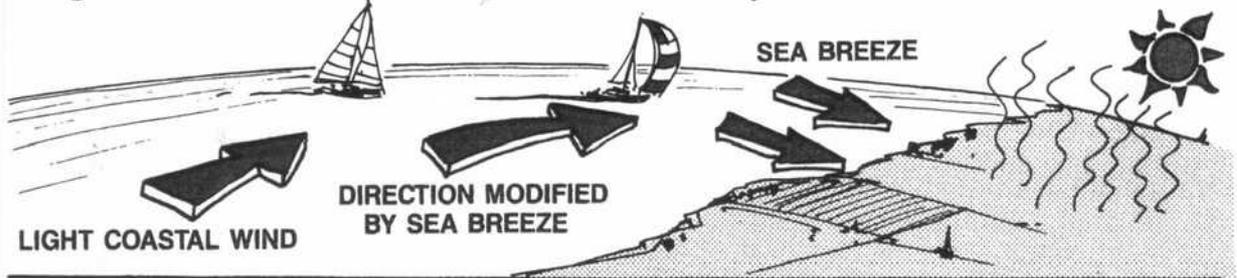
The difference between the direction of surface wind over land and water can be felt when tacking towards land.

*When close in, port tack wind becomes 'freer' while the poor boat on starboard can be 'headed'.*

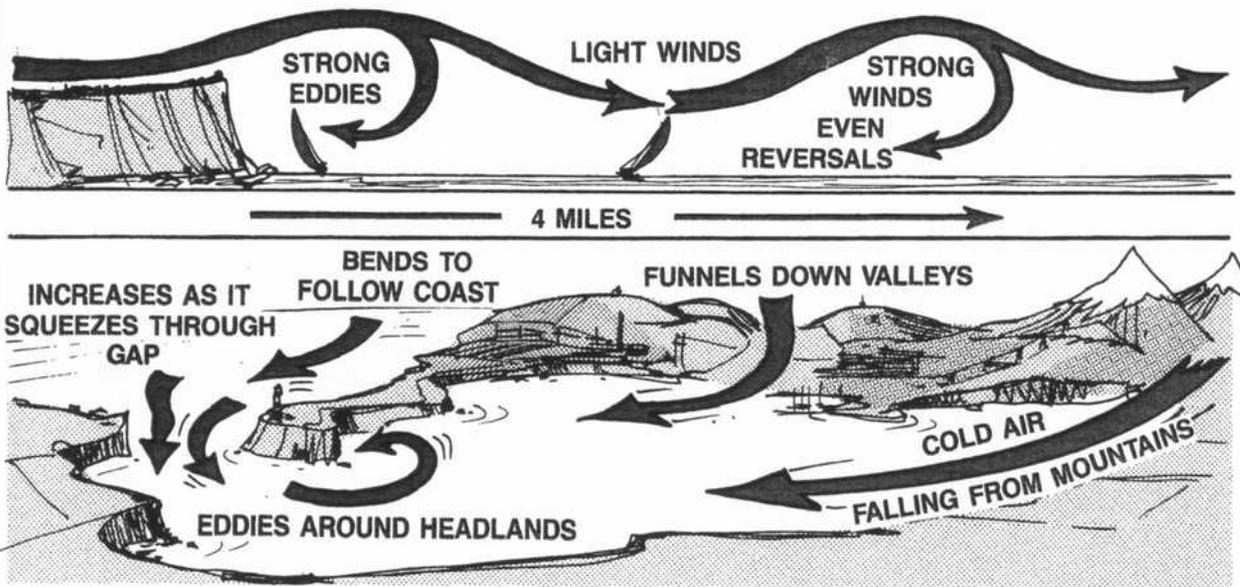




Light coastal wind direction can be modified by a sea breeze.



Wind blowing offshore over cliffs can be very turbulent with strong eddies close in and bands of strong and light winds stretching far out to sea.

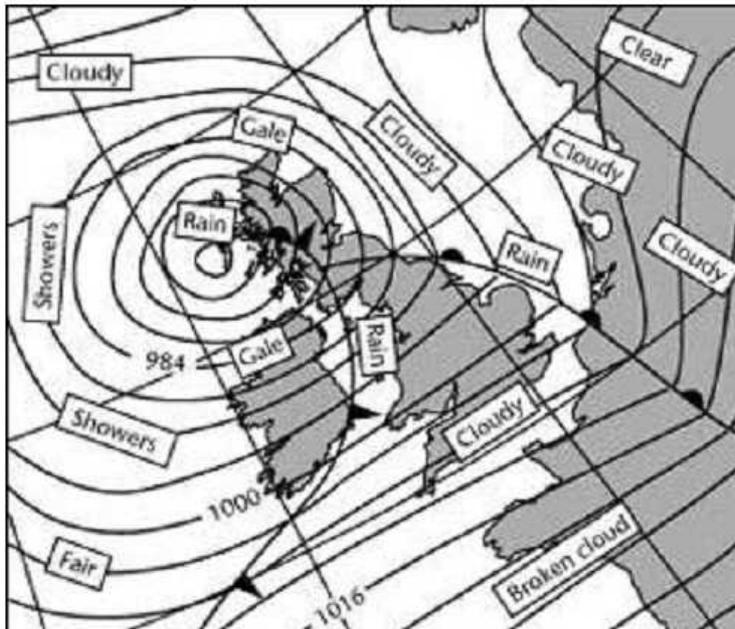


Both the speed and direction of the wind can be changed quite dramatically by the shape and temperature of the land.



### FOG

Sea fog is formed as warm maritime air drifts northwards over colder water and picks up moisture on the way. When the air is cool enough the moisture condenses to form fog.



In general, the weather is strongly influenced by the wind direction, so information about the wind provides an indication of the type of weather likely to be experienced.

However, this approach is effective only if the wind is blowing from the same direction for some time.

A marked change in wind direction usually indicates a change in the weather. Northerly winds tend to bring relatively cold air from polar regions to the British Isles. Similarly, southerly winds tend to bring relatively warm air from the tropics. The characteristics of

the air are also affected by its approach to the British Isles. Air picks up moisture if it travels across the sea, but remains relatively dry if it comes across the land. As cold polar air moves southwards over an increasingly warm sea, the heating of the air by the sea causes cumulus clouds to form. These clouds may grow sufficiently for showers to develop and, consequently, winds from the north-west, north or north east usually bring cold, showery weather to the British Isles.

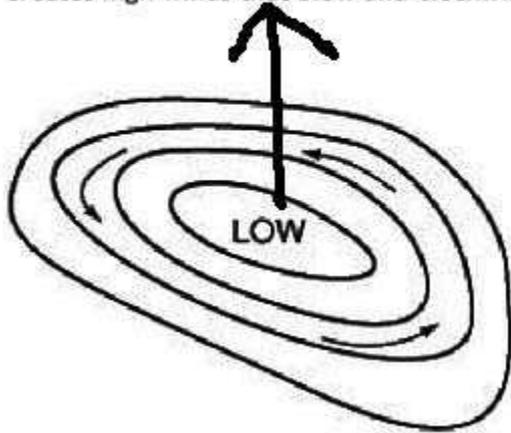
Warm air from the tropics moving northwards over the sea is cooled from below. Sometimes the cooling is sufficient for sea fog or a thin layer of stratus to form. The cloud can become thick enough for drizzle, especially on windward coasts and over high ground.

In general, winds from the west or south-west are associated with overcast, wet weather. Winds from the south and south-east mainly occur in summer and these bring warm, dry weather. However, southerly winds can sometimes bring hot, thundery weather.

Easterly winds in winter bring very cold air to the British Isles. The characteristics and path of the air determine whether it is cloudy (with perhaps rain, sleet or snow) or fine and sunny. In summer, an easterly wind will mean it is cool on the east coast but warm elsewhere, usually with clear skies.

**15.10 Depressions (Low) /anticyclones (High) pressure/ Wind**

Low Pressure makes air rise,  
creates high winds that blow anti-clockwise



In a depression (also referred to as a 'low'), air is rising.

As it rises and cools, water vapour condenses to form clouds and perhaps precipitation.

Consequently, the weather in a depression is often cloudy, wet and windy (with winds blowing in an anticlockwise direction around the depression).

There are usually fronts associated with depressions.

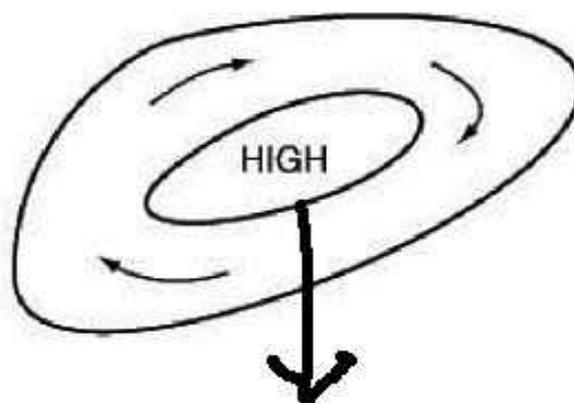
In the depression the winds flow anti clockwise. For the UK that will mean from the South West to the North. The image below shows a low over the UK. The white arrows are wind and their size indicates wind strength. Light blue if the rain that in this case comes with the wind.

Note how when isobars are close together on a weather map (usually a low pressure area) the winds are usually much stronger.



In an anticyclone (also referred to as a 'high') the winds tend to be light and blow in a clockwise direction. Also the air is descending, which inhibits the formation of cloud.

The light winds and clear skies can lead to overnight fog or frost. If an anticyclone persists over northern Europe in winter, then much of the British Isles can be affected by very cold east winds from Siberia.



**High Pressure makes air fall.  
Winds are light and blow clockwise**

However, in summer an anticyclone in the vicinity of the British Isles often brings fine, warm weather. A trough has characteristics similar to those of a depression, and in a ridge the weather is similar to that in an anticyclone. The changeable weather in the British Isles is caused by a succession of depressions with their associated fronts and anticyclones (or ridges) running across the country from the Atlantic Ocean.

In the picture below we see high pressure over the UK. Minimal, if any winds. If there were winds, they they would probably be very light and flow clockwise (from North to South west).



# BEAUFORT SCALE OF WIND FORCE

Beaufort Number	General Description	Sea State	Velocity in knots
0	Calm	Sea like mirror	less than 1
1	Light air	Ripples formed, no foam crests	1-3
2	Light breeze	Small wavelets, short but more pronounced. Crests glassy but do not break.	4-6
3	Gentle breeze	Large wavelets, crests start to break. Foam glassy, scattered white horses.	7-10
4	Moderate breeze	Small waves becoming longer, fairly frequent white horses.	11-16
5	Fresh breeze	Moderate waves, more pronounced long form, many white horses, some spray.	17-21
6	Strong Breeze	Large waves start to form, extensive white foam crests, spray.	22-27
7	Near Gale	Sea heaps up, white foam from breaking waves starts blowing in streaks along wind direction	28-33
8	Gale	Moderately high waves in greater length, crests break off in spindrift, foam blown in well-marked streaks.	34-40

*Note these are average speeds the yachtsman may experience one force higher in the gusts.*

## MEANINGS OF TERMS USED IN WEATHER FORECASTS

**GALE WARNINGS:** if the average wind is expected to increase to F8 or more, or gusts of 43kn are expected. **SEVERE GALES** if the wind is expected to increase to F9 (41kn) or over, or gusts of 52 kn are expected.

**STORMS:** if the average wind is expected to increase to F10 (48kn) or over, or gusts of 61kn are expected.

**IMMINENT:** within 6 hours from time of issue of the warning.

**SOON:** between 6-12 hours from time of issue.

**LATER:** after 12 hours from time of issue.

**WIND STRENGTHS:** Land forecasts use the following: Calm = 0; Light = F1-3; Moderate = F4; Fresh = F5; Strong = F6-7; Gale = F8.

**VISIBILITY:** descriptions of visibility in shipping forecasts mean the following:

**Good:** more than 5nM

**Moderate:** 2-5nM

**Poor:** 1,100yds to 2nM

**Fog:** less than 1,100yds

Coastal station reports use the following:

**Mist or haze:** 1,100-2,200 yds

**Fog:** less than 1,100yds

**FAIR:** used when there is nothing significant. ie. no showers, mist, rain, etc.

**PRESSURE and TENDENCY:**

**Steady:** Change less than 0.1mb in 3 hrs

**Rising or falling slowly:** Change 0.1 to 1.5mb in last 3 hrs.

**Rising or falling:** Change 1.6 to 3.5 mb in last 3 hrs.

**Rising or falling quickly:** Change 3.6 to 6.0mb in last 3 hrs.

**Rising or falling very rapidly:** Change of more than 6.0mb in last 3 hrs.

**Now falling, now rising:** Change from rising to falling or *vice versa* within last 3 hours.

**PRESSURE SYSTEMS,** speed of movement:

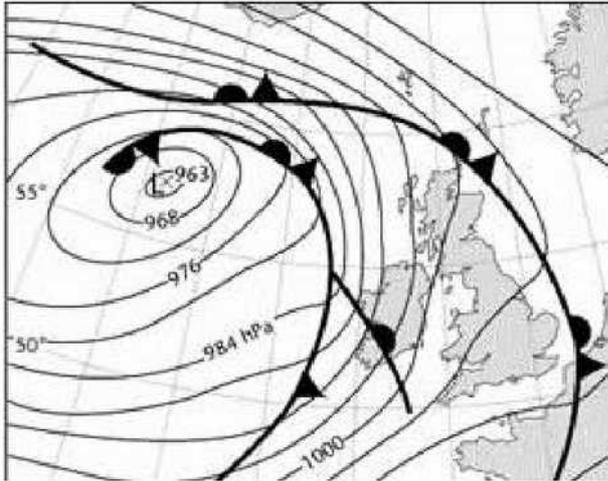
**Slowly:** up to 15kn

**Steadily:** 15-25kn

**Rather quickly:** 25-35kn

**Rapidly:** 35-45kn.

## 15.11 Warm and Cold Fronts



The boundary between two different types of air mass is called a front.

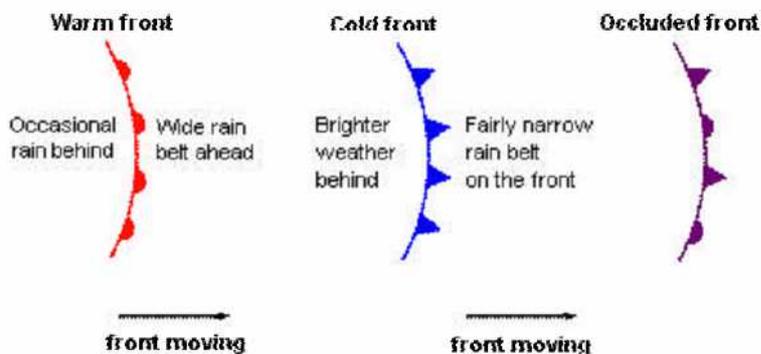
In our latitudes a front usually separates warm, moist air from the tropics and cold, relatively dry air from polar regions.

On a weather chart, the round (warm front) or pointed (cold front) symbols on the front point in the direction of the front's movement.

Fronts move with the wind, so they usually travel from the west to the east.

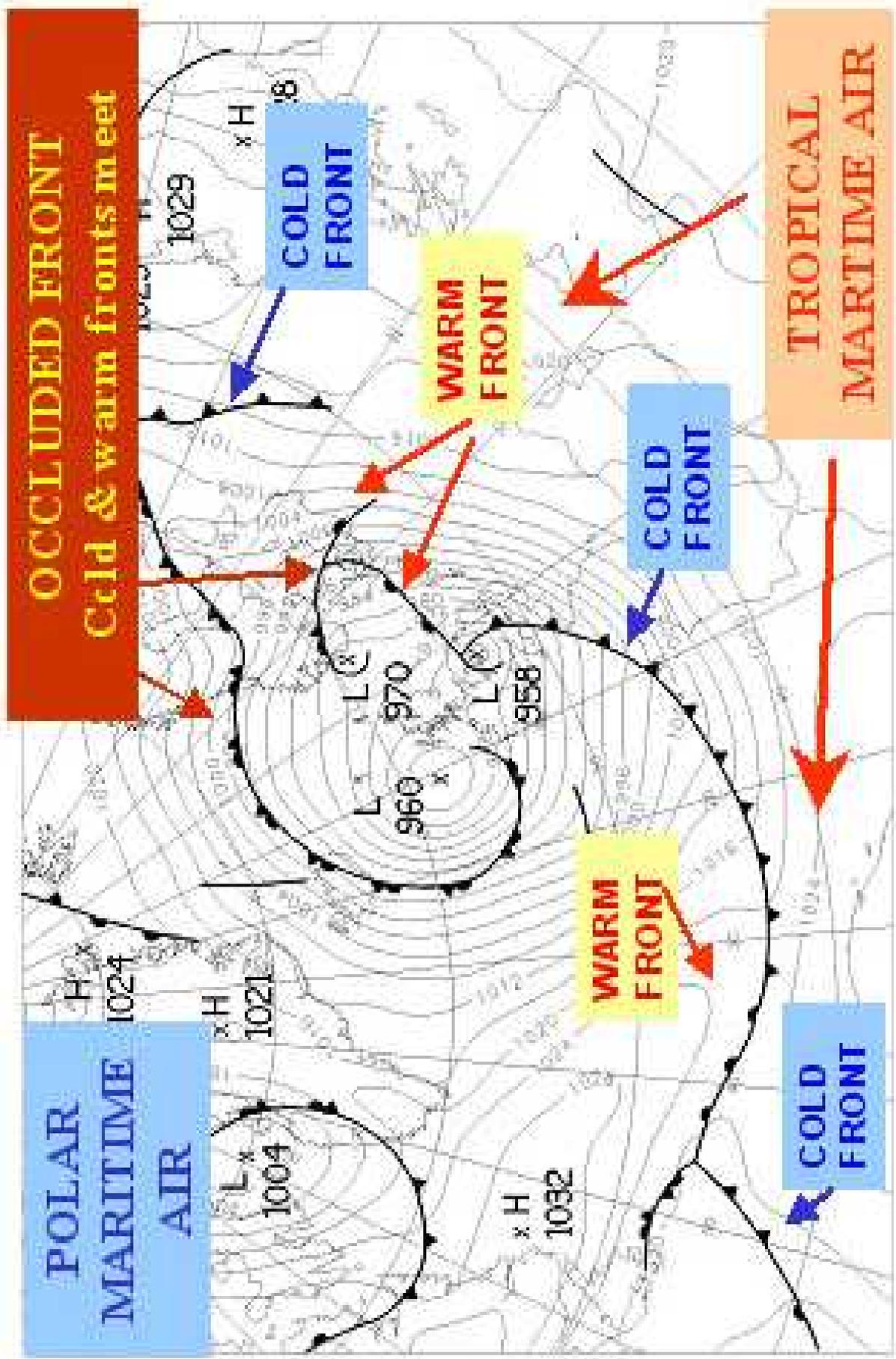
At a front, the heavier cold air undercuts the less dense warm air, causing the warm air to rise over the wedge of cold air. As the air rises there is cooling and condensation, thus leading to the formation of clouds. If the cloud becomes sufficiently thick, rain will form. Consequently, fronts tend to be associated with cloud and rain. In winter, there can be sleet or snow if the temperature near the ground is close to freezing.

It is convenient to distinguish between warm fronts, cold fronts and occluded fronts.



A front which is moving in such a way that the warm air is advancing to replace the cold air is called a warm front. As the warm front approaches, there is thickening cloud and eventually it starts to rain. The belt of rain extends 100-200 miles ahead of the front. Behind the front the rain usually becomes lighter, or ceases, but it remains cloudy.

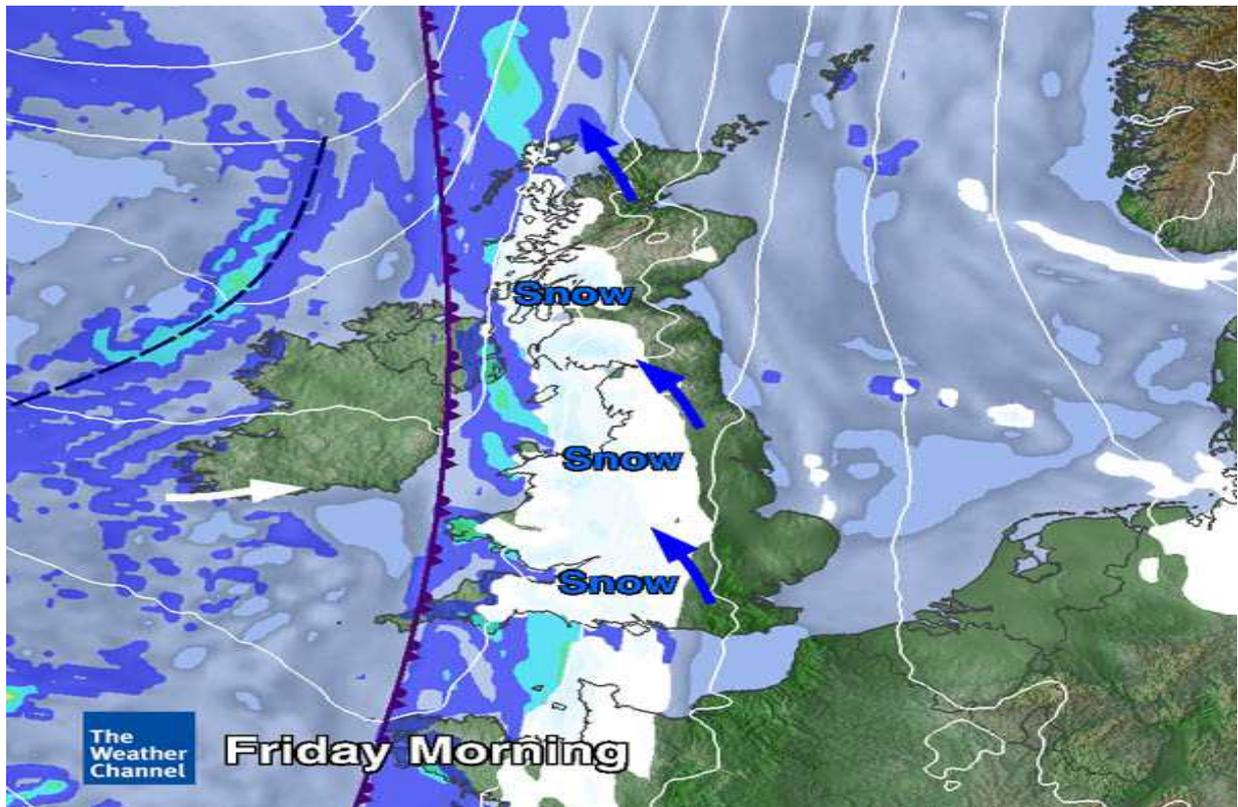
As a warm front passes, the air changes from being fairly cold and cloudy to being warm and overcast (typical of warm air from the tropics travelling over the sea). Also there is a clockwise change in wind direction, and the wind is said to 'veer'. A cold front moves so that the cold air is advancing to replace the warm air. This means that as a cold front passes, the weather changes from being mild and overcast to being cold and bright, possibly with showers (typical of cold polar air travelling over the sea). The passage of the front is often marked by a narrow band of rain and a veer in the wind direction. An occluded front can be thought of as being a result of the warm and cold fronts meeting. Consequently, ahead of an occlusion the weather is similar to that ahead of a warm front, whereas behind the occlusion it is similar to that behind a cold front. The characteristics given for the fronts apply to active fronts. If the front is weak, the rain associated with it is light or non-existent, and the changes across the front are less marked.



**15.12 Forecasts on TV, Internet and radio**

The TV channels use simplified weather maps but you should understand what they mean. Here are a few examples. If the volume was turned down on the TV, what would you think is happening in the following weather reports?







**Wind direction**  
**20 April 2010**  
North-westerly



**Projected wind direction**  
**24/25 April 2010**  
South-westerly



## Website Weather Forecasts

The British Government created the Meteorological Office or abbreviated to the Met Office. They know everything about UK weather and all other bodies (BBC, Radio, magazines etc) take their info from them. Therefore go to the Met Office and cut out the middle man.

Look up <http://www.metoffice.gov.uk/weather/uk>

Here is a sample of a 5 day weather forecast from the Met Office.

Date	Time	Weather	Temp	Wind			Visibility
				Dir	Speed	Gust	
Mon 10 Mar	2100		8 °C	NE	10 mph	20 mph	Good
	0000		7 °C	NE	10 mph		Very Good
	0300		7 °C	NE	9 mph		Good
	0600		7 °C	NE	10 mph		Good
Tue 11 Mar	0900		7 °C	NE	10 mph		Good
	1200		10 °C	ENE	10 mph	20 mph	Good
	1500		11 °C	ENE	11 mph	21 mph	Good
	1800		9 °C	ENE	10 mph		Good
	Night		5 °C	ENE	6 mph		Good
Wed 12 Mar	Day		14 °C	ENE	8 mph		Very Good
	Night		4 °C	E	4 mph		Good
Thu 13 Mar	Day		14 °C	SW	2 mph		Good
	Night		5 °C	NW	3 mph		Good
Fri 14 Mar	Day		13 °C	WNW	6 mph		Very Good
	Night		6 °C	W	7 mph		Good

Last updated: 1801 on Mon 10 Mar 2014

The Met office has also created apps for mobile phones. Their data shows detailed forecast for the next 24 hours (in 3 hour intervals) then 12 hour time intervals.

Other countries have their own 'Met Office' service.

Exercise: Find the official Met Office websites for France, Germany and Italy

## Radio Weather Forecasts



Radio 4 broadcast a shipping forecast for all sea areas around the UK. There are some odd names. Here is an example transcript:

### ***Viking***

*Gale warnings - Issued: 1532 UTC Fri 14 Mar*

*Storm force 10 veering north westerly imminent, then decreasing gale force 8 soon*

*Shipping Forecast - Issued: 1625 UTC Fri 14 Mar*

***Wind:*** *Westerly veering north westerly gale 8 to storm 10, decreasing 5 or 6.*

***Sea State:*** *Very rough or high, becoming moderate or rough later.*

***Weather:*** *Rain then showers.*

***Visibility:*** *Moderate or poor, becoming good.*

As an exercise, find out when the shipping forecast is broadcasted and on which radio channel.



### **15.13 Forecasting by looking at the horizon**

Firstly, you need to work out the direction of the wind and face that direction. Any weather behind you has passed and is generally no longer a concern.

You can look at a cloud against something fixed, (like your finger on an out stretched arm) and see which way it moves.

Or you could wet your finger and hold it up. The side the wind is blowing from will be cold.



In the following pictures, we will presume the weather is coming towards you.

This picture shows a beach scene. Notice the dark streaks from the cloud to the sea. This is rain. Note the heavy dark colour of the cloud. That is full of moisture (water) and will probably drop a lot of rain.



This next picture shows a blue sky behind some trees with some wispy clouds behind some trees. If the wind is coming towards you and from this scene, then the dark but wispy clouds will not drop any rain. Likewise the orange/ light grey clouds will not have enough moisture in them to risk rain. This is probably a sunset.



This picture shows a coast line. Rain is falling as streaks falling from the cloud to the ground. The cloud is very dark therefore contains a lot of moisture and with the ambient temperature results in rain. If it was colder it could drop snow.



Note the dark grey clouds. If the temperature is low enough snow form in the clouds. You can there is already snow on the ground. If the temperature is slightly higher you could sleet (like a wet snow) and if higher still, rain.



What do you think will happen in these weather pictures ?



## **15.14 Weather Lore**

Weather Lore (or weather sayings) ...just for a bit of fun

from: [http://www.scoutresources.org.uk/weather/weather\\_weatherlore.html](http://www.scoutresources.org.uk/weather/weather_weatherlore.html)

Weather lore is almost as old as the human race, and as extensive. However its scientific use is doubtful.

Where rules and sayings apply to weather in the longer term, beyond the next few days, then experience and logic suggest that they are worthless.

Dubious weather lore sometimes appears to persist because of a desire to believe in magic or the supernatural, this is also seen in the widespread acceptance of astrology.

The following present some of the best known.

---

**When March comes in like a lion it goes out like a lamb, when it comes in like a lamb, it goes out like a lion** - March is at the end of the long, northern hemisphere winter when the sun is moving northwards over the equator and the temperature contrast between high and low latitudes is greatest. This means that the strength of the westerly circulation is also near its maximum and vigorous depressions bring plenty of wet and windy spells across the British Isles and Western Europe in most years. The saying does reflect the changeable nature of spring weather with a high probability of different types of weather early and late in the month.

**Rain before seven, fine before eleven** - Four hours of continuous rain occur occasionally in temperate latitudes when a weather front becomes slow moving, perhaps with waves, but periods of rain are usually shorter. Seven and eleven were perhaps chosen because other four hour periods do not scan well.

**Long foretold, long last; short notice, soon past** - This is true insofar as the slow advance of a depression with falling pressure and thickening cloud brings bad weather often lasting a day or more, whereas rapid clouding over is more likely to be the precursor of a single shower or a smaller fast-moving depression.

**Red sky in the morning, shepherd's warning; red sky at night, shepherd's delight** - Near sunset and sunrise rays from the low sun travel a much longer distance through the atmosphere encountering many more dust particles. These scatter the longer wavelength red end of the light spectrum (when the sun is high in the sky, that is why the sky appears a blue colour). A red sky at night suggests a clear sky for hundreds of miles beyond the western horizon, and no imminent frontal systems bringing rain. Red sky in the morning tells us little about what is approaching from the west, but only that eastern skies are largely clear. However when this corresponds to the zone of fine weather which often exists between two depressions, then it suggests that it is moving away eastwards with more bad weather not far away to the west.

**Ice in November to bear a duck, the rest of the winter'll be slush and muck** - Winter in the UK rarely sets in before December, the coldest months are usually January and February. A very cold snap in November is unlikely to last, and will usually be followed by a milder spell with a thaw. November's weak sun will dry the ground only slowly if at all, and slush and muck aptly describes conditions underfoot in the countryside when mild wet weather follows snow and ice.

**Warm October, cold February** - There are similar relationships between months and may occur more than expected over certain periods and less over others. They have no long term value and such sayings are invalid.

**Mackerel sky and mares' tails, make tall ships carry small sails** - High cirrus clouds often form well ahead of depressions and their associated fronts. Mackerel skies and mares' tails describe forms of cirrocumulus and twisted sheaves of cirrus respectively implying strong high-level winds. In the days of sailing ships they will have been rightly viewed as likely forerunners of stormy weather.

**Evening red and morning grey, two sure signs of one fine day** - Morning grey probably refers to early morning mist, fog or shallow low cloud which often form on clear, near clam nights, but soon disperse after sunrise on a fine summer day. More extensive cloud especially with strong winds prevents the red sunset and overnight mist or fog, and of course a fine day is much less likely.

**If clouds be bright, 'twill clear tonight. If clouds be dark, 'twill rain - d'ye hark** - Bright clouds suggest sun shining through gaps between and on to cumulus clouds, which result from the sun heating the ground when the atmosphere is unstable. These clouds often dissolve towards sunset to give a clear, cold night. Dark clouds are usually deep and more extensive. They do not usually vary much with local solar heating or the lack of it, and often bring rain.

**A green Christmas makes a fat churchyard. A cold May gives full barns and empty churchyards** - The first of these sayings may refer to an increased spread of infections (in years gone by) when a mild Christmas encouraged the more susceptible old and young folk out to worship and celebrate. The second may be explained by cold, wet springs encouraging sturdy if slow crop growth and discouraging early insect pests. These strong plants may have produced better harvests in those years, leaving more to store through the following winter and better nutrition for the populace.

**Cast not a clout 'till May be out, 'Till April's dead, change not a thread** - A clout here means a piece of clothing. Both sayings date from when a single set of clothes would be worn throughout the winter. They simply mean that April and even May can be cold, so do not be misled by a warm spell.

**When trout refuse bait or fly, there is ever a storm a nigh** - This is likely to stem from the idea that if fish are biting, fishermen are oblivious of the weather, if the fish are not biting then fishermen blame the weather!

**Turkeys perched on trees and refusing to descend indicate snow** - It is more likely to indicate the proximity of Christmas, intelligent birds and nothing to blame the problem on but the weather!

**Cows lying down is a sure sign of rain** - Cows regularly lie down to chew the cud!

**In by day. Out by night. (of wind)** - This is a short description of the diurnal change between sea breezes blowing in from the sea during the day and land breezes out to sea overnight.

**A bright circle round the sun denotes a storm and colder weather** - Thin cirrostratus cloud often produces both solar and lunar halos. It precedes depressions which bring rain and strong winds, and eventually colder weather to the rear.

**Always a calm before a storm** - This is frequently true but not always. Thunderstorms develop during hot sultry afternoons, when there is little wind, but once formed they produce strong down draughts and squally winds.

**The sudden storm lasts not three hours. The sharper the blast, the sooner 'tis past** - These both truly reflect the difference between the sudden heavy deluge and squally winds from a heavy shower or thunderstorm, and the generally steadier and often prolonged frontal rain associated with depressions.

**When the clouds go up the hill, they'll send down water to turn a mill** - This may stem from the increase of cloud first seen over hills as moist southerly winds pick up ahead of a depression. The mill in this case would be a water mill.

**Oiled floors become damp before rain** - This is one of the many sayings that reflect the increased humidity in the air which often precedes rainy weather. Water condenses on to cold surfaces as air in contact is cooled below its dewpoint. Thus stone floors and walls in unheated building and with little or no covering will become damp.

**If the ash is out before the oak, you may expect a thorough soak. If the oak is out before the ash, you'll hardly get a single splash** - This saying is contradicted by the following: If the oak is out before the ash, 'twill be a summer of wet and splash, But if the ash is before the oak, 'twill be a summer of fire and smoke. The truth is one or the other often applies each year!

**If it rains on St Swithin's Day (15 July) then we shall have rain for forty days** - This is nonsense! The legend has it that St Swithin died in 862 and was initially buried outside in accordance with his wishes. About a century later, on 15 July, he was reinterred inside the church. It is likely to have been wet on that day and for most of the forty days following, with superstitious minds quick to connect this with his displeasure. Not only is it surprising that the legend has persisted, but also that similar ridiculous sayings exist in other European nations: in France St. Medard on 8 June; in Belgium St. Godelieve on 27 July; and in Germany the day of the Seven Sleepers on 27 June.

**A piece of kelp or seaweed hung up will become damp previous to rain** - Any truth probably comes from salt remaining on the surface of the weed. Salt is hygroscopic, which means it will absorb moisture when the air is humid. This may mean the chance of rain is slightly higher. Sailors noted that ropes tend to be harder to release ahead of rain (they shrank). Musical stringed instruments sound as tension increased due to shrinking. Rush matting was found to shrink in dry and expand in hot weather.

## **16. Kit List**

The following packing lists are the official ones suggested by the DofE. You should discuss with your supervisor what kit you require for the terrain you are carrying out your expedition in.

EXPEDITION KIT LIST		
<b>CLOTHING</b>		
<b>Got it</b>	<b>Packed it</b>	<b>Item needed</b>
		1 pair walking boots (broken in)
		2 pairs walking socks
		2 pairs sock liners (optional)
		2-3 t-shirts
		Thermal t-shirt (optional)
		2 fleece tops or similar
		2 walking trousers (warm, NOT jeans)
		Underwear
		Nightwear
		Flipflops/trainers/sandals etc (optional for evenings)
		Warm hat &/or sunhat (as appropriate)
		1 pair gloves (if appropriate)
		1 pair shorts (if appropriate)
		Sunblock (if appropriate)
		1 pair gaiters (optional)
		Waterproof over-trousers
		Cagoule/coat (waterproof & windproof)

<b>PERSONAL KIT</b>		
<b>Got it</b>	<b>Packed it</b>	<b>Item needed</b>
		Rucksack
		Rucksack liner (or 2 strong plastic bags)
		Sleeping mat
		Sleeping bag
		Waterproof bag for storing sleeping bag
		Sleeping bag liner (optional)
		Survival bag
		Small quantity of money (optional)
		Notebook & pen/pencil
		Watch
		Wash kit/personal hygiene items (some items could be shared as a group)
		Towel

<b>PERSONAL FIRST AID KIT</b>		
A personal first aid kit should include the following:		
<b>Got it</b>	<b>Packed it</b>	<b>Item needed</b>
		At least 2 pairs of disposable vinyl (latex-free) disposable gloves
		A large individually-wrapped sterile unmedicated wound dressing
		An individually wrapped sterile unmedicated wound dressing
		An assortment of individually wrapped sterile unmedicated adhesive dressings (e.g. Melolin squares)
		An individually wrapped triangular bandage
		2-3 individually wrapped antiseptic wipes
		Crêpe bandage
		Large safety pins
		Small pair of safety/medical scissors
		A pair of tweezers
		Assorted adhesive plasters (e.g. zinc oxide, fabric strip, waterproof)
		Microporous (medical) adhesive tape
		Blister plasters
		Chiropody felt
		Burns wound dressing
		Eye wash (can also act as a wound wash)

Participants should make the Expedition Supervisor, Assessor, other staff and team members aware of any relevant medical condition that may impact on their, or others, safety. Participants should also make people aware if they are allergic to anything, including antibiotics or any other medicine or drug.

In discussion with their Expedition Supervisor, participants might also include in their personal first aid kit appropriate personal medication, painkillers, antiseptic cream, antihistamine/bite cream and rehydration tablets/sachets.

GROUP KIT (to carry between the team)		
Got it	Packed it	Item needed
		Tent(s)
		Camping stove(s)
		Camping stove fuel in an appropriate & safe container
		Cooking pans
		Scourers
		Tea towels
		Food (lightweight & including snacks)
		Plastic bags (for rubbish etc.)
		Toilet paper
		Maps (1:50 000/1:25 000)
		Compass(es)
		Map cases
		Camera (optional)

**ADDITIONAL OPTIONAL KIT for you to consider**

These are items that might not be necessary on every expedition but which can be very useful/essential in certain situations.

Got it	Packed it	Item needed
		Storm shelter
		Stove multidisc
		After-sun cream
		Insect repellent
		Stopwatch
		Mosquito net
		Emergency lightsticks
		Water purifying tablets
		Travel plug
		Waterproof bags
		Security pouch
		Waterproofing (pre-expedition )
		Pre-packed expedition food
		String
		Spare boot laces
		Tin opener
		Sunglasses
		Ball, playing cards etc.
		Menu guidance
		Hydration pack / water bottles
		Trowel (maybe to dig a toilet?)

## 17 Choosing Suitable Clothing and Equipment

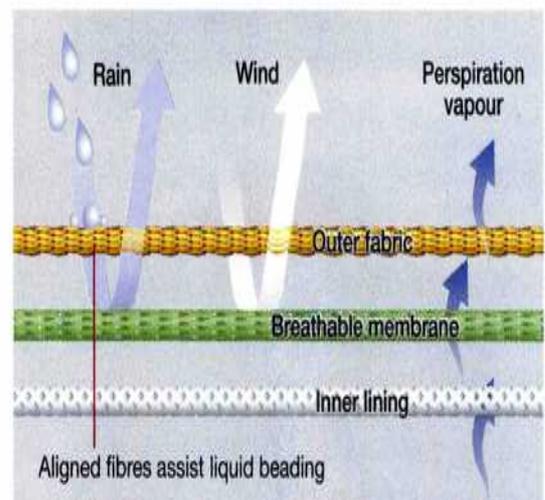
### Clothing

The best way to protect yourself from the elements is by using a layer system. This works on the principle that air is an excellent insulator, therefore the more layers of air you trap the greater the degree of insulation. This is why two thin jumpers are better than one thick one.

**Inner Layer** - The major role of the layer that comes into contact with your skin is to wick (draw) moisture away from the skin to leave a dry layer next to the body. Of the modern materials available at the moment the best is probably 100% polypropylene, which is what most good quality thermal underwear is currently made of. Of the more traditional materials wool and silk are unbeatable, although most people find wool too itchy to wear in direct contact with the skin.

**Thermal Layer** - The purpose of this layer is to form an insulating barrier between you and the outside elements. Wool again is a good choice, which has the added advantage of being a good insulator even when wet. (Wet wool can actually emit a small amount of heat due to a chemical reaction). However wool is heavy and bulky and becomes even heavier when wet and takes a long time to dry. Wool has now been largely replaced by fleece materials, which too retains its insulation properties when wet, but they are weight for weight warmer than wool, and generally less bulky.

**Outer Shells/ Coats** - Gone are the days when it is necessary to carry a separate wind proof and water proof coats as nowadays a single garment can comfortably perform both functions. When looking for a coat it is important to make sure it has taped seams and a strip of material (baffle) to cover the zips to prevent wind blowing straight through them. If it has a detachable hood make sure that when it is attached there is no way of wind or water running down your neck. Whichever type of coat you choose the water proofing will not last forever so they will need reproofing



### **Top Tip:**

**Never take jeans or other heavy woven cotton material on expedition or camping. It just gets damp and you will never be able to dry it.**

## **17.1 Footwear**

There are many types of footwear available for various outdoor activities.

The most important thing is that they are the right size, comfortable and suitable for the task. They can be made of leather or man made material (plastics), both of which can be waterproof so long as you treat them in the correct manner. Whether you wear one pair of socks or two is up to you and whatever you feel most comfortable with.

Therefore it can be OK to use trainers with a heavily textured/ gripped sole for a summer walk. But for an autumn walk with wet weather and mud, probably not.

Footwear website ref:

[http://www.magazine.ordnancesurveyleisure.co.uk/magazine/tscontent/editorials/gear-guides/2011/top-tips-for-buying-walking-boots.html?utm\\_campaign=Newsletter%2B8th%2BJune%2B2011&utm\\_source=emailCampaign&utm\\_medium=email&email=newsletter8june](http://www.magazine.ordnancesurveyleisure.co.uk/magazine/tscontent/editorials/gear-guides/2011/top-tips-for-buying-walking-boots.html?utm_campaign=Newsletter%2B8th%2BJune%2B2011&utm_source=emailCampaign&utm_medium=email&email=newsletter8june)

### **Top tips for buying walking boots**



Boots are the most important piece of walking kit, so it pays to get the best fit you can. With the huge range of boots now on the market, your feet shouldn't get a hammering every time you go out walking. If boots don't fit properly, you won't have support for your feet and ankles, and you'll be prone to blisters, chafing and other foot problems. Too much room and they'll rub up and down, too little and your feet and toes will be scrunched up.

Before you start looking at boots, you need to think about what type of terrain you're going to be walking on most of the time because this determines the type of boots you need. If you do mostly lowland, forest and track walking then a pair of lightweight waterproof fabric-style boots will probably do the job. If you plan on tackling tougher places including long distance trails, peat bogs, hills and mountains then the more solid and tough leather boots are better.

Here are some tips for buying walking boots:

#### **Terrain**

Think about what type of ground you're going to be walking on most of the time; this determines the type of boots you need. Material boots are ok for lowland, forests and tracks, long-distance walks, and can also be used in drier weather on hills and mountains, but for boggy ground you'll need a more solid leather upper that will be more waterproof. If you ever intend to wear crampons for winter walking you need to make sure that your boots are capable of taking them.

## **Boot size**

The best time to try on boots is probably in the afternoon; this is the time between your feet being slightly smaller than normal and a bit swollen and larger as the day goes on. Your left and right foot will almost certainly be a slightly different size, so it's best to try both boots on; and always go for boots that fit your largest foot.

## **Seasonal fit**

Your feet tend to be bigger in spring and summer so what do you do? The answer is to buy your boots so you've got a little bit of extra room for the warmer months (say a half size bigger), but not too much so they'll also fit in winter and your feet won't move around in them. You can always use either thicker socks or a thin insole in winter, but you can't make boots smaller than they are.

## **Socks**

Ideally, you should try boots on with the type of socks you usually wear. If you're buying boots for the first time, try them with a pair of medium thick walking socks. If you prefer walking with a thin sock and a thick one over the top then take them along to the shop. You need to wear whatever socks are comfortable for you, as long as they're good quality and fit well.

## **Flexible friends**

All boots have a certain amount of 'give' in them, and you need to be able to flex and bend your feet to a reasonable extent with the boots on. The more lightweight the boot usually the more flex you'll get, but with all boots you should at least be able to wriggle your toes around.

## **Big enough?**

There are 3 ways to test for correct boot size:

- **Finger test** – push your toes to the end of the boot and then put your index finger down the back of the boot. If you can do this, you've probably got enough room for your toes to move about, but not too much so you'll slip around inside.
- **Bare feet test** – sounds weird when you'll always be wearing socks, but you can get a feel for where any parts of the boot might rub or make your feet sore by putting them on without any socks.
- **Measurement test** – this is done in most outdoor leisure and shoe shops using what's called a Brannock's device, incidentally designed in 1927. This isn't an instrument of torture, it just accurately measures the width, length and arch of both your feet to help you choose the right size and fit.

### **Top Tip:**

**Wax your boot laces with Vaseline or some other lubricant. It reduces the friction and therefore stops them wearing and snapping. This will make them last longer**

### **Breaking them in**

With modern boot materials your feet don't have to go through torture until your boots were comfortable to walk in, known as 'breaking them in'. The boots should adjust to your feet, not the other way round. However, it's wise to wear them in the house after you buy them, and a fair bit more on shorter walks outside before you take them out on a long trek.

### **Test your boots at home**

Most shops and online stores will allow you to return boots after a reasonable time as long as you haven't worn them outside, you've kept the box, and they can still sell the boots to someone else. Check this before you buy - if the shop won't agree to a refund or exchange if worn at home, then go elsewhere. This is important because the best way to test boots for comfort is by wearing them over a period of time, not just in the shop.

Once you get your new boots home:

- Wear them around the house for periods of say an hour at a time – this builds up the heat of your feet naturally as they would when you're out walking.
- Climb the stairs in them to mimic uphill and downhill.
- Do the hoovering in them to get your feet moving and twisting.
- Walk on different indoor surfaces and check for any signs of discomfort, rubbing or tightness.
- Wear them at different times, because your feet swell the longer they're in them and more so later in the day.
- Try lacing them up differently; keep laces loose, tie right up to the top, overlap top laces.
- This is when you test out the theory that they'll 'stretch a bit'.

There's likely to be a few small niggly feelings of discomfort at first, but this is usually due to the boots getting used to your feet, or that your feet are not used to wearing boots. However, if you have any doubt about the fit, particularly that they're too small – never say 'they'll just do', take or send them back and try a different type or size.

### **17.2 Equipment list**

- head torch
- gaiters
- waterproofs
- micro – light weight fleeces

Choosing and caring for camping gear.

Packing a rucksack,

What at top middle bottom?

Rolling clothes to fit better into a rucksack

### **17.3 Tents**

The type of tent you take will depend what you have in store.

We just need you to think about:

- Suitability for the area you will camp in (wind etc)
- Style and manufacture of tent

Every experienced camper has their favourite style of tent. Here are a few examples.



Vango Typhoon:

Very stable in wind. Medium weight for 2 people.  
(approx 3.7kg)

Vaude tent.

Great design, ultra light weight. Perhaps a little less room inside for 2.



**KMD TO ADD MORE TYPES OF TENT AND ADD MORE DETAIL TO THIS SECTION**

**ADD THINGS LIKE ANGLE OF TENT PEGS,  
POSITION OF TENT IN FOUL WEATHER,  
SAFE POSITION NEAR TREES (INC DEAD BRANCHES ETC),  
SPLITTING IT UP TO LIGHTEN LOAD ON ONE PERSON,  
CLEANING KIT ON RETURN,  
REPORTING DAMAGE ON RETURN,  
TEMPORARY REPAIRS ETC...**

## Types Of Tents

From

<http://www.gooutdoors.co.uk/expert-advice/tent-buying-guide>

### **A Tent Perfect For Family Breaks**

Designed for a multitude of activities and ideal for sheltered campsites as opposed to a rugged open top mountain, Family tents are ideal for novice campers. Family tents may have multiple sleeping areas for all the family and sewn-in integral ground sheets to maximise comfort for that homely feel, and for this reason they may be higher priced than a simple backpacking tent. Family tents also tend to be heavier as they are designed for out of the car camping trips.

### **A Tent Perfect For Trekking Holidays**

Trekking tents allow you to venture away from crowded summer campsites and out into the back of beyond. These tents will be smaller in size to reduce weight and pack size, but are still larger than a simple backpacking tent. Designs are normally tunnel or geodesic shape, allowing the best in wind resistance, rigidity and stability in open areas such as fields.

### **A Tent Perfect For Mountain Expeditions**

If you're set on a mountain expedition, your tent needs to be able to cope with strong winds and bad weather. Mountain tents have lower profiles for the maximum in wind resistance, stability, rigidity and ease of pitching. For the ease of use and light weights, these tents are usually a little more expensive but are worth it when weather is severe.

**For Festivals:** Look to a tent that houses 1 person extra than the amount of people camping, this will give you the extra space needed for rucksacks and other gear. Another great feature to look for is a tent with a built in porch, to make sure you can ditch those muddy wellies outside of the tent to keep the inside clean. Pop up tents make ideal, easy pitch tents for festivals, for those who don't fancy pitching and tent the traditional way.

### **Pitching**

If a pole jams when being threaded into a sleeve it is likely one of the metal joints is caught. Check for snagging & release it. If you find that a zip is difficult to close, adjust the pegging or pitching of the tent to alleviate the strain. In high temperatures, the flysheet will tighten. Slacken guy lines to avoid over-stressing the attachment points.

### **Inner Pitching Tents**

The poles are threaded through or clipped to the inner to pitch the tent

The poles are threaded through or clipped to the inner to pitch the tent

#### **Pro's**

More streamlined in the wind as they have no external pole sleeves

More stable as the fly and inner are tensioned together



**Con's**

- Inner gets wet when pitching in the rain
- Securing the flysheet can be difficult in windy conditions
- Can't be pitched as one
- Less well ventilated

**Outer (Flysheet First) Pitching Tents**

<http://www.gooutdoors.co.uk/camping/tents/family>>Click here to view all Family Tents

The poles are threaded through or clipped to the flysheet to pitch the tent

The inners or bedrooms are then clipped inside. The inners can be left fixed in allowing the tent to be pitched as one.



**Pros**

- Can be pitched as one
- Inners stay dry when pitching in the rain
- Better ventilation

**Cons:**

- Catch the wind more as they usually have external pole sleeves
- More space lost between the inners and flysheet

**Poles and Tent Shapes**

There are four main types of pole configuration, most flexi pole tents will fall in to one of these categories corresponding to the number of **nodes** it has. A **node** is the point where the tents poles cross.

[Tunnel](#) (0 nodes)

[Dome](#) (1 node)

[Semi Geodesic](#) (2-4 nodes)

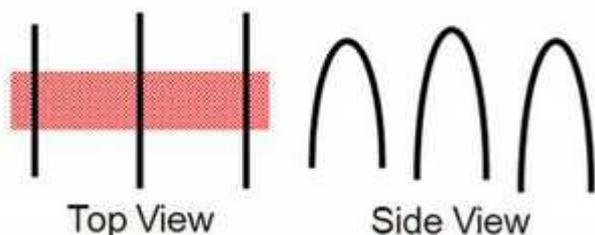
[Fully Geodesic](#) (5+ nodes)

Pros & Cons of different types of nodes



**Tunnel Tents**

**Tunnel tents** are in general the **quickest to pitch** and they are the **most spacious** type of tent for their weight. Tunnel tents also give more head room than most other tents with their maximum internal height running right down the centre of the tent (see red shaded area).

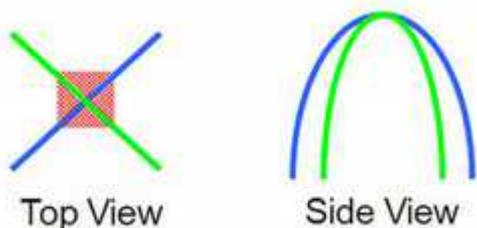


Tunnel are however **less stable** and must be fully guyed out regardless of conditions, this makes them less suitable for very hard or very soft ground. It is best to pitch tunnel tents either tail or nose into the wind. To improve stability some tunnels have internal bracing straps or extra poles running down the sides of the tent.

Tunnel style designs are usually used for Lowland, **Family** or Lightweight backpacking tents.  
><http://www.gooutdoors.co.uk/camping/tents/family>

### Dome Tents

**Dome** tents are a good compromise between stability, pitching time and weight. Although not as light for their size or as quick to pitch as a tunnels, they are **more stable**.



Dome tents however tend to have **less head room**, their highest point being located only at one point in the centre (see red shaded area).

The lack of head room is usually worked around by adding extra poles to make space for porches or bedrooms (see example). These add-ons are effectively single pole tunnels and have the same advantages and draw backs.

Dome style designs are very versatile and are used in many Lowland, **Family** and **Trekking** tents.

<http://www.gooutdoors.co.uk/camping/tents/family>>Click Here to see all Family Tents

<http://www.gooutdoors.co.uk/camping/tents/festival-and-weekend>>Click Here to see all Festival and Weekend Tents



## Example

### Semi Geodesic Tents

**Semi Geodesic** tents are **much more stable** in bad conditions but are **heavier** and a little more complex to erect.

Most pole configurations are available in slightly different variations but semi geodesic tents vary greatly with 2,3 or 4 nodes, different numbers of poles, and different pole patterns. If you're not sure if it is Dome, Semi or Fully Geodesic just count how many times the poles cross.

Semi Geodesic style designs are also very versatile and are used in Lowland, **Family**, **Trekking** and some **Mountaineering** tents.

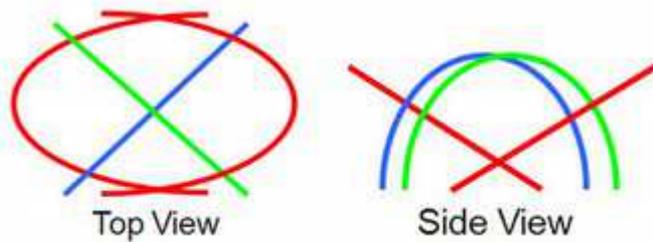
<http://www.gooutdoors.co.uk/camping/tents/mountain>>Click Here to see all Mountain Tents  
<http://www.gooutdoors.co.uk/camping/tents/backpacking>>Click Here to see all Backpacking Tents



## Example

### Fully Geodesic Tents

**Fully Geodesic** tents are the **most stable** tents available. Though heavy and **complex** to erect, the benefits outweigh the drawbacks if you are pitching your tent on a mountain and want it to stay there. This pole configuration is so **strong** that it can withstand heavy snow fall that would crush all other types of tent.



There are two main types of Fully Geodesic tent, one with 7 nodes (as seen here) and one with 5 nodes. The 5 node version is very similar but the two red poles don't quite meet and cross at the sides.

Fully Geodesic style designs are quite specialised and are used mainly in **Mountaineering** tents.

<http://www.gooutdoors.co.uk/camping/tents/mountain>>Click Here to see all Mountain Tents

<http://www.gooutdoors.co.uk/camping/tents/backpacking>>Click Here to see all Backpacking Tents



Example



The **Square Profile Pole** is a very simple development that can greatly increase the head room in a tent.

By simply adding two elbow sections (see examples below) at two points in the pole, the width of highest point in the tent (shown in red) is increased significantly.



This clever innovation can give a small tent **extra space** to sit up in and can make things like getting changed far easier.

In larger family tents it means **standing room** is available throughout the tent not simply down the centre.

Water and your tent...

### **Hydrostatic Head Pressure**

The majority of the tents we are sold made from polyester and of those the vast majority rely on a PU (polyurethane) coating to make them waterproof. These coatings come in different strengths, this strength is measured in Hydrostatic Head (hh). The **higher** the hydrostatic head the **more waterproof** the material and the longer the waterproof coating will last.

#### **Q. How is hydrostatic head measured?**

**Water pressure** is exerted on the material by fixing it across the bottom of a tube and slowly filling it with water. At the point where the water is forced through, 'A' is measured in millimetres giving you the hydrostatic head.

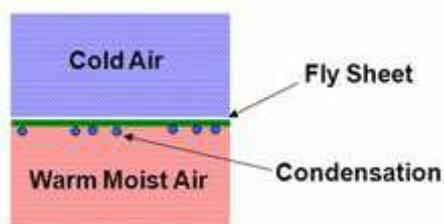
For a tent to be classed as **waterproof** it must have a HH of at least 1500. Flysheets can go up to and beyond 5000hh, while ground sheets can be **even higher**.

### **Condensation**

#### **Q. Why does condensation happen?**

**Condensation will occur inside most tents**, and is often incorrectly attributed to a leak in the flysheet or groundsheet.

Condensation occurs as the air inside the tent is warmed by the body heat of those inside, and made moist by water vapour expelled from the occupants breath. If conditions outside the tent are suitably different, condensation may form. It is for this reason that condensation may be a problem on one night but then not appear on the next.



When this warm moist air comes in contact with the colder fly sheet of the tent the moisture forms on the inner surface.

If present in large enough amounts this moisture starts to drip from or run down the fly sheet giving the appearance of a leak, but this is completely normal for the majority of tents.

**Q. How can condensation be avoided?**

**Maximise your ventilation;**

Where possible leave vents, windows and doors slightly open.

Only use storm flaps around the bottom of the tent when you need to.

**Control the moisture;**

Pitch your tent carefully so the fabric is taut and the inner and fly are not touching this will reduce drips and keep your inner dry.

Wipe the inside of the fly with a soft cloth to remove excess moisture.

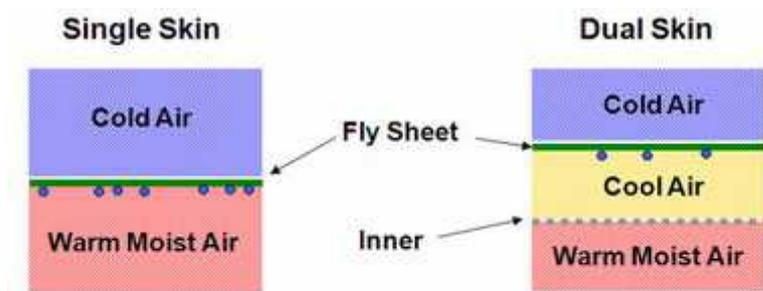
**Q. How does the design of the tent effect severity of the condensation?**

There are two main design characteristics that can affect and heavily reduce the levels of condensation:

- o Tent design (single or dual skinned)
- o Ground sheet style (standard or sewn-in)

**Single v's Dual Skin**

Any part of a tent that is single skinned is especially prone to condensation. Dual skinned sections of a tent create an insulating gap between the warm moist air and the cold fly sheet that greatly reduces condensation. The inner also catches drips and prevents the occupants touching the damp fly sheet.

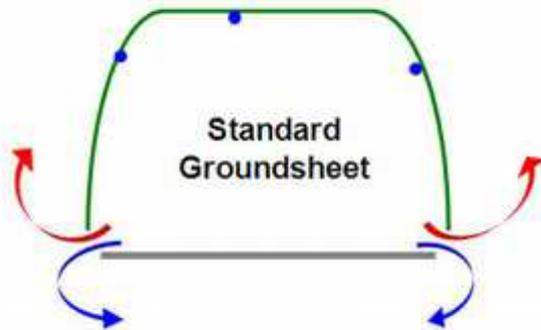


Some small budget and specialist tents are entirely single skin and will have the highest rates of condensation.

## Ground Sheets

Tents are available with two different styles of ground sheet, standard and sewn-in.

### Standard Groundsheet



Although standard groundsheets don't offer the same draft and insect protection as the sewn-in type they have **less problems with condensation**. To begin with, better ventilation reduces the amount of condensation. Furthermore if condensation is particularly bad the gap between the ground sheet and the flysheet gives any condensation that pools a place to escape.

### Sewn-in Groundsheet

Sewn-in ground sheets offer the **best protection** from drafts and insects but can suffer more from condensation as they are less well ventilated. Furthermore, excessive condensation has nowhere to escape. Note – Dual skinned tents that have sewn-in ground sheets don't have the same problem.

Useful extras worth thinking about ...

### Insect Netting

These are important when trying to get a restful nights sleep in remote parts of the Northern Highlands without scratching yourself every minute.

Midges, mosquitos and other flying insects can cause havoc to your enjoyment of a camping trip, but can this can be easily solved by buying a tent with insect nettings, placed in as standard in most tents.

Insects prefer to live in areas nearby to still water; such as lakes, pools and rivers and also like to be sheltered in wooded areas away from the windy conditions. It is therefore easy to remove the effect of these insects by pitching your tent away from these areas.

### Weight and packing size

If you are heading to 'the Peaks' for the weekend rather than car camping, then you will want a smaller packing, less heavy tent in your rucksack.

Always make sure your tent suits your every need and don't be afraid of measuring out your bag, comparing sizes and checking that your preferred tent will fit before you buy.

### Doors

This can be put simply down as your entrance and exit to your tent, but also is a major influence on condensation and the ventilation of your tent.

If you are thinking of buying a tent with a sewn in ground sheet then keep an eye out for ventilation flaps and extra door panels to keep your tent free from the water.

## **Tent Tips**

### **Before Going Away**

Have a practice session pitching your new tent. There are good reasons for doing this: It will allow you to familiarize yourself with the pitching process of your tent  
In the unlikely event of a defect, you will have the opportunity to resolve this before going away

### **Condensation**

Condensation happens in most tents & is often confused with leaking. To minimise condensation:  
Ensure all available vents are fully open  
Keep all storm flaps rolled up unless needed  
Shake off or wipe away any moisture inside the flysheet; wiping will not impair the waterproofing of the flysheet

### **Pole Care & Repair**

When folding poles, start from the center to prevent excess strain on the shockcord  
If shockcord fails it is still possible to pitch your tent with care. New shockcord is available from camping shops.

### **Getting your tent back in the bag**

For most tents, simply fold the inner & outer into a long thin shape, the same width as the pole bag, then roll the tent around the poles to help out the air.

IF NOT DRY – DRY IT OUT IMMEDIATELY YOU GET HOME.

### **17.4 Emergency bothy shelters**

Used for a quick shelter on the mountain. Gets you out of wind and rain and provides shelter for a casualty. Very lightweight and cheap.

If you have a largish group (12+) then it is worth taking 2 large (2 x 12 person) bothy shelters in case you have someone has an injury. In foul weather on a hike, the injured person and medic can be in one for a medical assessment/treatment and the other 'fit' group in the other.



### **17.5 Sleeping bags**

There are hundreds of different types of sleeping bags available in the shops today ranging from a £10 in a super market to £250 + in an outdoors shop. In general, as with most things, you get what you pay for.

So you need to decide what time of year you are camping and what the temperature is going to be like.

Sleeping bags are usually labelled with a number of "seasons", a 'one season' sleeping bag being suitable for summer use (providing it is warm or you are sleeping in a hut or caravan) and a 'four season' sleeping bag being suitable for all year round use. You can also purchase a liner to increase the warmth of your sleeping bag and it saves you from washing your sleeping bag so often.

Also, will you be sleeping with your clothes on (just over night /extreme lightweight camping) or using a tent pitched up in the same place for a week or so?

From [www.rei.com](http://www.rei.com):

#### **Sleeping Bags for Backpacking: How to Choose**



From <http://rei.com>

For a small amount of weight, a sleeping bag allows you to stay warm and comfortable despite the chill (or perhaps bitter cold) of a backcountry night.

This article helps you choose the best sleeping bag for backpacking. Not a backpacker? Read the REI Expert Advice article, [Sleeping Bags for Camping: How to Choose](#).

### The 3 Key Factors

A sleeping bag purchase can be boiled down to these 3 elements:

- **Temperature rating:** Choose a bag rated for the coldest temperature you expect to encounter. The rating is often part of the bag's name, such as the Men's REI Lumen +25 bag (rated to a minimum temperature of +25°F). Thanks to the EN standard, described below, this rating is now a highly reliable measurement.
- **Weight vs. roominess:** When backpacking, you want to keep weight low without jeopardizing comfort or safety. For some, low weight overrides all other concerns (comfort, durability, convenience, price). For others, weight is less important than having a roomy bag for a good night's sleep. Most bags try to strike a balance between these extremes.
- **Type of insulation:** Your main purchasing decision is between the types of fill: down, synthetic and the new water-repellent down. Goose-down fills are very light, compressible, durable and breathable. While initially more expensive, they offer great long-term value. Synthetic fills excel in damp, cold conditions and cheaper to purchase. They are slightly heavier and less compressible than down. Water-repellent down (e.g., DriDown™) is goose down treated to resist moisture.

For a closer look at EN ratings and what makes a bag comfortable, read on.

### EN Temperature Ratings

Sleeping bag ratings have undergone a revolution in recent years. Traditionally, a sleeping bag's temperature (or "comfort") rating pegged the lowest temperature at which the bag would keep the average sleeper warm. In this approach, a bag labeled a "20-degree bag" was one intended to keep most sleepers comfortable if the air temperature dropped no lower than 20°F.

#### Top Tip:

**To make a sleeping bag warmer, sleep with it inside a breathable Goretex bivvy bag. This creates another air barrier around you.**

Were these ratings infallible? No. All humans have different metabolic rates. Women, on average, have been scientifically proven to sleep colder than men. What's more, the U.S. outdoor gear industry never had a standard method to determine temperature ratings. Manufacturers assigned ratings based on their own research. Therefore, these ratings were at best a guide, not a guarantee.

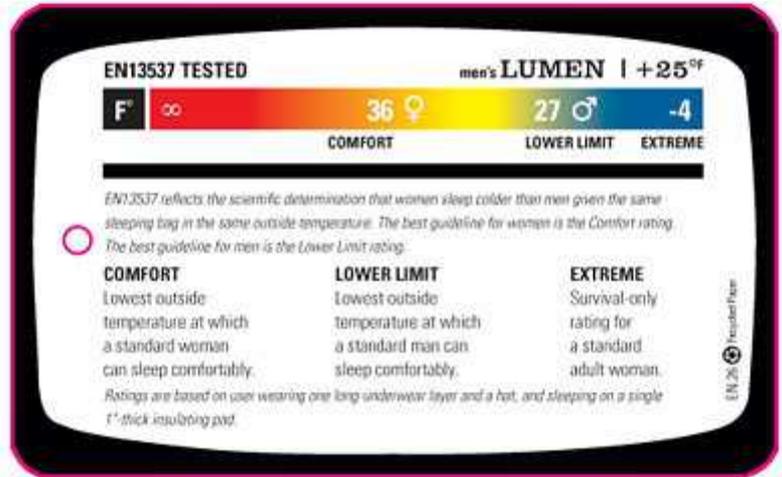
#### Consistent Ratings: EN Methodology

Enter the European Norm (EN) 13537 testing protocol. Already in European use for several years, EN was adopted in 2009 by REI and some other U.S. sleeping bag manufacturers seeking more reliable temperature ratings for their 3-season backpacking bags. (Most remaining manufacturers have since followed suit.) EN testing is performed in independent, internationally certified laboratories to ensure sleeping bags are subject to a standardized test.

The result? You can trust and compare head-to-head EN temperature ratings with those on other brands' bags.

Here's an example of the EN tag you'll find on all REI-brand 3-season backpacking bags:

*Note: The name of most sleeping bags (in this case the men's Lumen +25) includes a temperature rating that is typically rounded up or down to the nearest 5°F increment from the actual EN rating.*



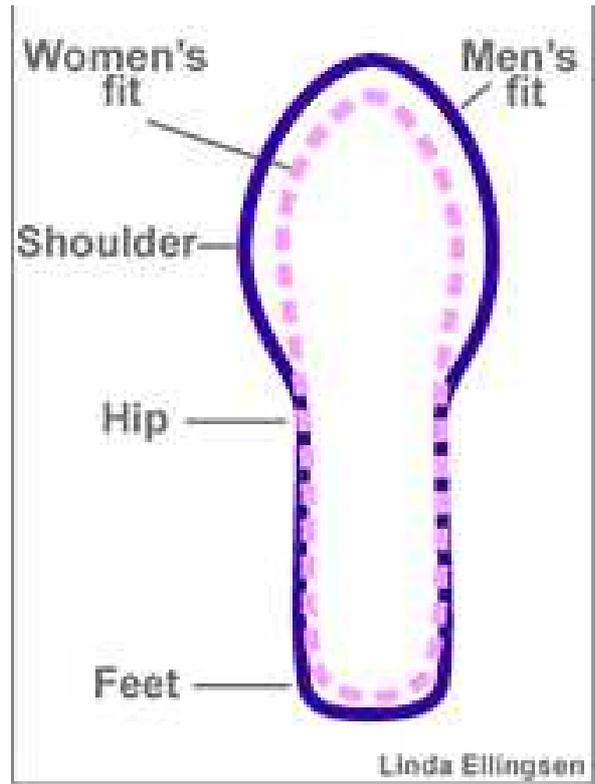
### EN Ratings Explained

EN 13537 testing reflects the scientific determination that women sleep colder than men given the same sleeping bag in the same outside temperature. So separate temperature ratings and terms are used for each gender:

- **EN Comfort Rating (for Women):** The lowest outside air temperature at which a standard woman can sleep comfortably in this bag.
- **EN Lower Limit Rating (for Men):** The lowest outside air temperature at which a standard man can sleep comfortably in this bag.

Keep in mind that EN ratings are based on a sleeper wearing one base layer and a hat, and using an insulating sleeping pad under the bag.

Bottom line? Women should look for the EN "Comfort" rating to decide if the bag will meet your needs. Men should check the EN "Lower Limit" rating.



An EN "Extreme" rating is also provided. It essentially describes a worst-case scenario. The bag isn't designed to keep anyone cozy in such low temperatures, but rather to keep a woman alive. It is advisable not to be too literal about the "Extreme" temperature rating.

### What Else Affects My Overall Warmth?

Besides a sleeping bag, these factors influence your warmth and comfort:

- **Sleeping pad:** This insulates the space beneath your bag as well as adding cushioning. On some bags, the pad replaces the need for insulation on the bottom side of the bag. If sleeping on snow or frozen ground, we recommend using 2 pads.
- **Tent:** Using a tent or bivy sack traps a layer of dead air around you, warming it by up to 10°F.
- **Metabolism:** You might be a "cold sleeper" who prefers extra insulation. Or maybe you are a "warm sleeper" who kicks off the covers at home.
- **Gender:** Women generally prefer slightly warmer bags than men.

- **Clothing:** Sleeping in long underwear and clean socks helps insulate you while also keeping body oils off of your bag. A cap and neck gaiter help retain body heat. For cold nights, a fleece jacket and pants can help.
- **Hood:** Sleeping bags with hoods can be cinched up on cold nights to help retain warmth.
- **Hydration:** Staying hydrated increases your likelihood of sleeping warm. A warm drink before bed is a popular tip.

### What Temperature Rating Should I Choose?

Sleeping bags that display EN ratings can be expected to provide comfort to the temperature stated on the bag, keeping in mind the variables described above.

For non-EN-rated bags, select a bag with a comfort rating that is lower than the lowest temperature you will experience. For example, if near-freezing temperatures are expected, then choose a 20°F bag instead of a 35°F bag.

**Tip:** You can always vent a bag on warmer nights by using the double-zipper to open the area by your legs. Or, simply drape the unzipped bag over you.

Sleeping bags are typically categorized like this:

<b>Bag Type</b>	<b>Temperature Rating (°F)</b>
Summer Season	+35° and higher
3-Season Bag	+10° to +35°
Cold Weather	-10° to +10°
Winter/Extreme	-10° and lower

### Women's Bags

These bags are specifically designed and engineered to match a woman's contours. When compared to men's bags, women-specific bags usually have the following characteristics:

- Shorter in length
- Narrower at the shoulders
- Wider proportionally at the hips
- Occasionally, extra insulation in the upper body and/or footbox

### Insulation: Down or Synthetic?

Sleeping bag insulation (or "fill") doesn't provide any warmth by itself; it works instead to minimize the amount of heat your body loses while sleeping. We explain more about the principles of heat loss below.

Two basic insulation types are commonly used—down and synthetic—with water-repellent down becoming a popular third option.

### Down (Goose or Duck)

Down is the natural plumage that forms the undercoating of waterfowl. It forms in tufts, or plumules, and consists of fluffy, wispy filaments. It is an exceptional insulator, prized for being light, easy to compress, durable and breathable. It excels in cold, dry conditions.

Down is more expensive than synthetic fill, but it maintains its loft (which provides its heat-trapping ability) at a near-original state longer than synthetics. That makes down a good value over the long haul.

Down comes from geese and ducks. Duck down is increasingly used in sleeping bags due to 1) advances in down processing techniques and 2) the scarcity of goose down, which has driven up its price.

All down, duck or goose, is measured according to **fill power**. This is calculated by how many cubic inches 1 oz. of down can fill in a testing device.

Higher-grade down, taken from more mature birds, requires fewer plumules to fill space and achieve a certain temperature rating. So any bag rated +20°F with **700**-fill-power down, no matter if its fill is duck or goose down, will be lighter than a +20°F bag using **600**-fill-power down.

If you place a pair of 600-fill-power sleeping bags side by side—one using duck down and one using goose down—their loft, weight and compressibility will have little or no variance. Fill power is fill power.

Where duck and goose down can potentially differ:

- **Top-end fill power:** Duck down can achieve fill-power ratings no higher than 750 or 800. Premium goose down can reach 900 and potentially even higher ratings, but it's quite expensive.
- **Durability:** Goose plumules are typically larger than duck plumules and can potentially retain their lofting ability for a longer time. One manufacturer estimates the average lifespan of a goose down bag (at its original temperature rating) is 25 years vs. 20 years for a duck down bag.
- **Odour:** Modern processing/cleaning techniques have reduced the possibility that duck down, when wet, can exude a gamey smell—the natural result of the eating habits of ducks. It is conceivable, however, that people with a heightened sense of smell may still detect a slight odor from duck down no matter how clean or dry duck down is.

Many major bag-makers have made the transition to duck down throughout their product lines. Testing, ratings and performance standards should be the same no matter which fill is used.

### Water-repellent Down

Moisture is the chief nemesis of down. Wet down becomes matted and flat, losing its ability to retain heat.

New proprietary technologies (e.g., DownTek and DriDown) apply, at a microscopic level, a water-repellent treatment to down filaments. This allows the filaments to resist light moisture such as a mist without compromising loft.

Manufacturer testing indicates down with a water-repellent treatment can withstand dampness our bodies create inside a bag through body vapour. The technologies are also believed to help damp down dry out faster and minimize (or perhaps eliminate) any odour caused when down gets wet.

Even treated down will get wet if dunked in a stream or exposed to heavy rain. It is **water-repellent**, not **waterproof**.

The cost of treating down minimally affects the price of bags, adding up to \$0 to \$20 to their cost. No standardized tests have been established for gauging the effectiveness water-repellent down. Manufacturers use their own tests to self-confirm the merits of the technologies.

### **Synthetics**

Synthetic insulators (usually a type of polyester) retain much of their warmth even when wet, so they are a good choice in damp climates. They are quick-drying, nonallergenic and (in high-end bags) almost as light as down bags.

The downside is that a synthetic bag offers a little less warmth for its weight, plus its insulating power gets reduced each time it is stuffed into a stuff sack.

There is a long list of competing brand names for synthetic insulations, which can make shopping confusing. A more relevant distinction is knowing whether a synthetic insulator is short-staple or a continuous filament.

Short-staple fills (e.g., PrimaLoft®) are the predominant choice. Their short strands of fine-denier filaments are densely packed to minimize heat loss. This makes these bags feel soft and flexible, much like a down bag, and allows for great compressibility. They are, however, a bit less durable. Continuous-filament fills (e.g., Climashield®) use a thicker continuous filament that is lofty, strong and durable. They have a stiffer feel and are less compressible than short-staple bags.

### Which Insulation Is Right for You?

Choose a down or water-repellent down bag if you want superior warmth, compressibility and durability. Though initially more expensive, down's superior durability makes it a good long-term value.

Choose a synthetic bag if you want both good performance and a lower price tag. Short-staple synthetic bags offer excellent compressibility, while continuous-filament synthetic bags are more durable. Synthetic fills are usually the better choice for wet climates.

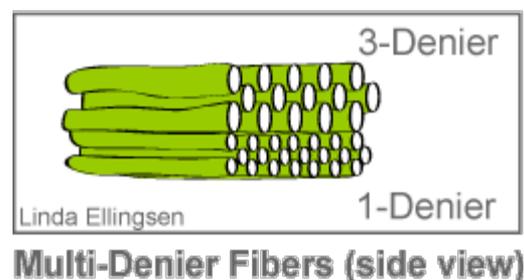
### The Basics of Heat Loss

Sleeping bags keep you warm by trapping and holding a layer of "dead" (non-circulating) air next to your body. The dead air is warmed by your radiated body heat, with the bag forming a barrier between this air and the colder ground or outside air. The less air space there is to heat, the faster you warm up.

The key concept behind this is equilibrium: Nature always seeks to balance temperature differences (e.g., hot objects in a cool room will cool to room temperature and vice-versa). Sleeping bag insulations try to minimize equilibrium by retaining your body heat.

There are 4 main types of heat loss that bags guard against.

- Convective heat loss is the primary culprit. It refers to heat lost through air currents. Bags minimize this by using a complex tangle of insulation strands or plumules to block air trying to escape from your body to the cooler outside air. Dense filaments of larger diameter fibres (approximately 3 denier) block these most effectively.
- Radiant heat loss relates to heat dissipating away from your body. This amount of loss is less significant and depends on the difference in temperature between 2 visibly adjacent surfaces (e.g., from your skin to the bag's inner shell, or from the bag's inner shell to the insulation inside). This heat travels as waves through the air and is best absorbed and radiated by smaller-diameter plumules or fibres (about 1 denier) and fill that is white in colour.



- Conductive heat loss refers to objects of different temperatures that are in direct contact with each other. For the backcountry sleeper, this refers to your body's contact with the cold ground. An insulating foam sleeping pad offers your best defence against this heat loss.
- Evaporative heat loss is the chill caused by moisture transforming from a liquid to a vapour. You have undoubtedly felt the cooling of wet skin as evaporation occurs. Similarly, you should always change from sweaty clothing to clean, dry clothing when getting into your sleeping bag. In extreme cold conditions, consider a vapour barrier liner or vapour barrier clothing. These can limit the cooling caused by evaporative heat loss and reduce the water needed to stay hydrated, but may feel clammy at warmer temperatures.

Sleeping bag designers must balance the ideals of loft, compressibility and weight when considering how to address these heat-loss issues.

## **Sleeping Bag Construction**

### **Shape and Fit**

The shape of a bag certainly affects your sleeping comfort. All true backpacking bags are mummy-shaped, but some semirectangular camping bags can double for use in the backcountry. To compare sizes, look for the shoulder and hip girth specs provided on REI.com product pages.

Some guidance:

- For maximum thermal efficiency and less weight, choose a mummy bag with narrower shoulder/hip specs. Some folks, however, find it hard to get comfortable in these more restrictive bags.
- If you have a broad frame or are a restless sleeper, consider mummy bags with larger shoulder/hip specs or semirectangular bags for greater comfort. These bags are a bit bulkier and heavier, though.

## Baffles, Shingles and Layers

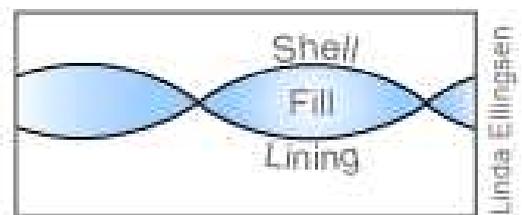
Insulation can be held between a bag's outer shell and inner lining by several techniques. Down bags use a system of baffles; synthetic bags use either a network of shingles or a layered approach. The goal of any construction technique is to ensure an even distribution of insulating fill.

Down bags typically use the following baffle constructions:

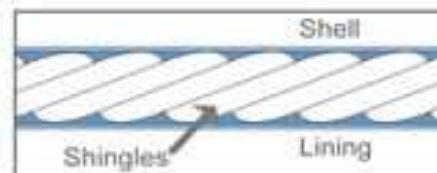
- **Box:** This durable approach keeps down from shifting so you enjoy consistent warmth. Variations include trapezoidal and slant boxes, which are often used in the footbox since a 3-dimensional design cannot use a parallel-sided box.
- **Sewn-through:** This weight-saving technique is used on ultralight bags as their lesser amounts of insulation preclude the need for a baffle. The downside is that it can allow cold spots at the stitched areas.

Synthetic bags typically use one of these constructions:

- **Shingles:** Shingles are cut pieces or sheets of fill stitched to both the shell and lining. They overlap each other somewhat like the shingles on a house.
- **Layered:** Most popular is the offset-quilt approach. This features 2 layers of continuous insulation offset to reduce cold air penetrating the quilted seams. Simple, but effective. Another version, known as quilted-through, is a sheet of insulation cut to fit the shape of the bag. The shell, insulation and lining are all sewn together with a single stitch line. This less-expensive technique is used only on warm-weather bags since it is prone to cold spots.



Sewn-through baffles

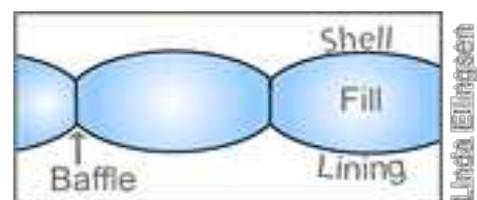


Shingles

## Shell and Lining

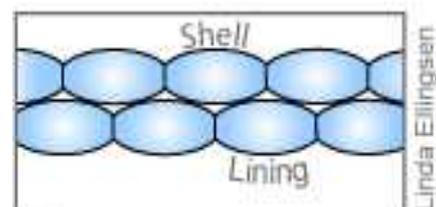
The outer shell of a sleeping bag is typically made of a ripstop nylon or polyester for durability. The shells of most high-quality bags are treated with a durable water repellent (DWR) finish. DWR causes water to bead up rather than soak through the fabric

The inside lining of a sleeping bag, on the other hand, should promote the dispersal of body moisture, so DWR is not used here.



Box baffles

**Tip:** How can you tell if a shell has a durable water repellent (DWR) treatment? Rub a wet cloth across the surface of a bag. If the water beads up, then it has DWR.



Offset-quilt layers

## Bag Length

### Men's

**Short:** For people up to 5'6"

**Regular:** For people 5'7" to 6'0"

**Long:** For people 6'1" to 6'6"

Note: The North Face offers a few X-Long bags for campers up to 6'8".

### Women's

**Regular:** For women up to 5'6"

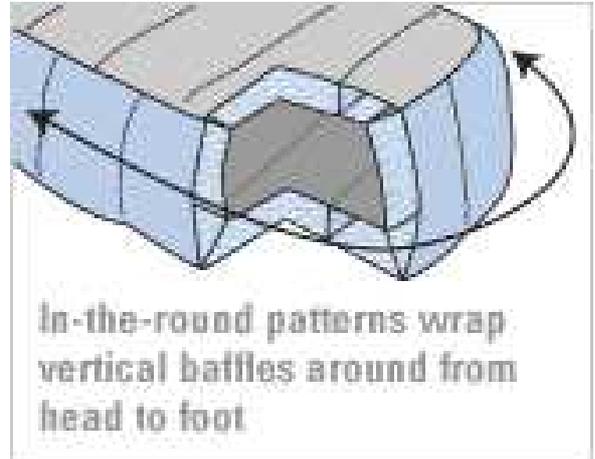
**Long:** For women 5'7" to 6'0"

## Other Bag Features

**Zipper compatibility:** Many backpacking bags can be zipped together for sleeping by couples. Just know that mating 2 bags creates gaps inside, so it's a less efficient way to stay warm. You can mate any 2 sleeping bags IF:

- One bag has a "right-hand" zipper and the other a "left-hand" zipper. A right-hand zipper means the bag opens and closes to your right when you are lying in the bag on your back.
- The zippers are the same size. Most brands use either a size #5 or #8 zipper, so these sizes need to match.
- The length of the zippers is compatible. Some bags have 1/2-length zippers, others use 3/4-length zippers. You can still zip together bags with different zipper lengths, but you may have cold spots where the zippers don't match up.

It's also OK to mate bags of differing comfort ratings. You can arrange it so the warmer bag covers the colder sleeper.



**Hood:** You can lose a significant amount of heat through your head, so virtually all backpacking bags include a built-in hood. When cinched with a drawcord, a hood prevents heat from radiating away. Some hoods offer a pillow pocket that you can stuff with your clothing to create a pillow.

**Draft tube:** This is an insulation-filled tube that runs alongside the bag's main zipper. It's designed to keep warmth from escaping between the zipper coils.

**Draft collar:** Usually found on bags rated 0°F or colder, these are insulated tubes positioned just above the shoulders to prevent body heat from radiating up and out of a bag.

**In the round:** This proprietary REI design technique creates 3-dimensional "sides" to a sleeping bag. These vertical baffles, shingles or layers help provide efficient warmth to a bag's head, side and foot sections.

**Stash pocket:** This keeps small items, such as your MP3 player, watch or glasses, close at hand. Pocket locations can vary by model.

**Pad loops:** These sewn-in straps provide an attachment point so you can secure your sleeping pad directly to your sleeping bag so you won't roll off.

**Trapezoidal footbox:** This design adds space in the foot area to allow a more natural sleeping position for your feet. This is most useful if you



sleep on your back rather than on your sides. The extra space also reduces the tension your feet put on the bag, which improve longevity of the insulation.

### **Sleeping Bag Liners**

Sold separately, a sleeping bag liner is primarily used to help keep your mummy bag clean and thus make it last longer. (Note: Rectangular sleeping bag liners are often called "travel sheets.") A bag liner also adds anywhere from 5° to 15°F of extra warmth to your sleeping bag, depending on the liner material. In hot climates, you can use a bag liner or travel sheet by itself and forgo the sleeping bag



Your bag-liner material choices:

- Silk: Very lightweight (about 5 oz.). Silk helps insulate in cold weather but is absorbent and breathable in warm weather. Price: moderate to expensive
- Cotton: Strong, durable and absorbent, but not the lightest or most compact. Price: economical.
- Fleece and microfleece: Warmer (adds up to 12°F) and heavier. Fleece is soft, moisture-wicking and quick-drying, but the mid- and heavyweight varieties are bulky. Price: moderate.
- Synthetics (CoolMax and MTS®): Moisture-wicking and breathable, which makes these great for humid conditions. Has a bit of stretch, too. Price: moderate
- Insulated (Thermolite Reactor Extreme): This adds up to a claimed 25°F of warmth thanks to its hollow-core fiber insulation. It also dries 50% faster than cotton. Price: moderate to expensive.

### **17.6 Wearing glasses**

If you wear glasses (...and the best of us do) you may want to consider using contact lenses for outdoor navigation work. When there is very light rain or mist it is virtually impossible to keep your glasses clear.

Some older scouts may be long and short sighted at the same time. Consider wearing just one contact lens in your dominant eye for looking at distant objects and keep the other eye for the close up map work.



## **18. Rucksack - fitting and packing**

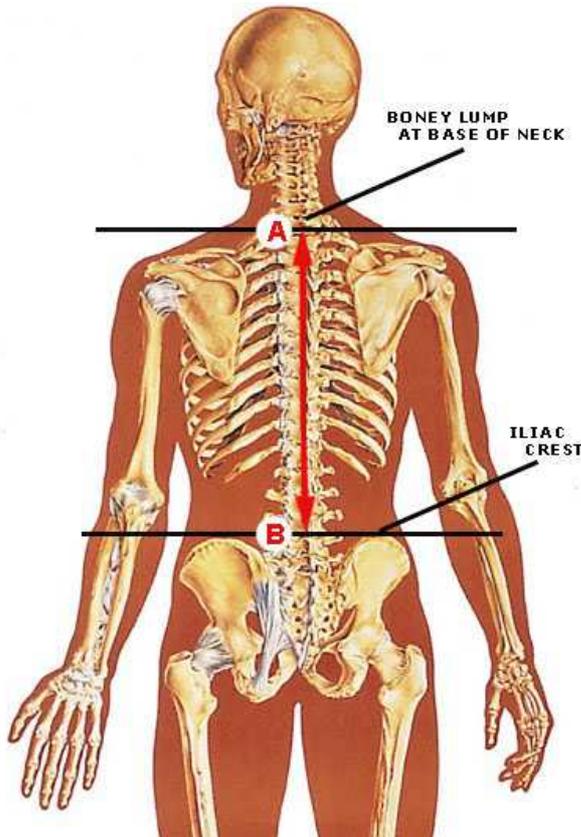
Generally heavy equipment, needs to be up high and near your body

Make sure balanced

Make sure all strapped down tightly

Roll every thing up tightly – it saves sooooo much space

Rucksack fitting



**To get the right size you need to measure your back length.**

A rucksack it starts at the C7 (cervical) vertebrae (top of shoulders) and ends at the hip bone. In the diagram 'A' and 'B'.

Your height does not determine which backpack is suitable. You need a measure of your back from A (c7 vertebrae) to B (top of pelvic cage) .

Have a friend assist you. Tilt your head forward as it will help your friend locate the bony lump at the base of your neck. This is 'A'. They can use a piece of masking tape for reference if necessary.

Locate the pointy protrusions (iliac crest) on the front of your hips by sliding your hands down the side of your torso. Once you locate the crest, point your thumbs (hands on hip pose) toward each other on a parallel line. Where this

imaginary line (or placed masking tape) crosses the spine is B.

Your friend will then measure the distance, following the natural curve of your back, from A to B . You will mostly likely fall into one of these 3 categories:

Small – up to 44cm/17.5” ,

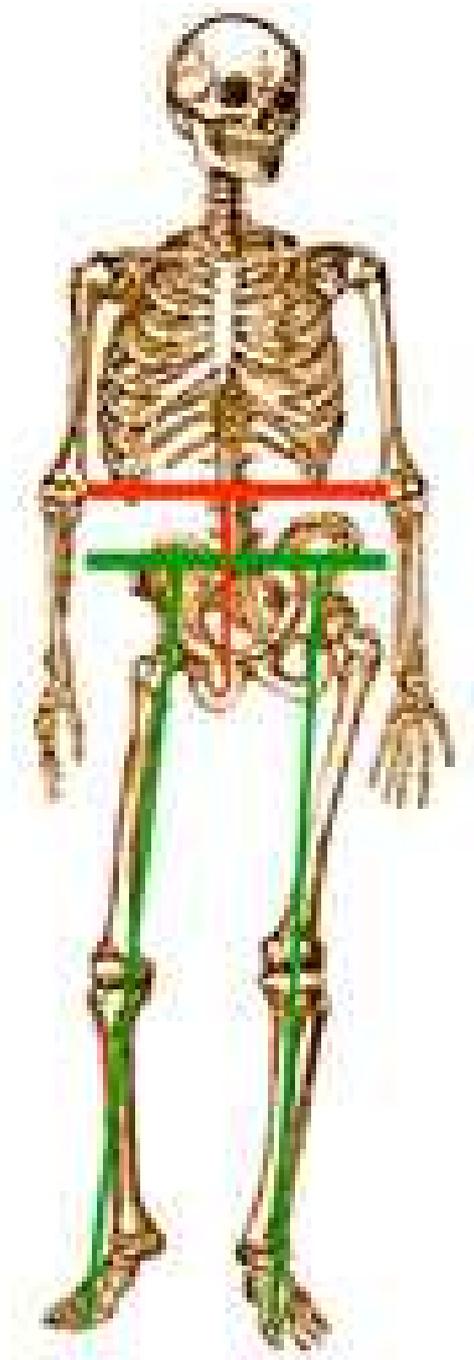
Medium/Regular – 45cm to 49cm/18” to 19.5” ,

Large/Tall – 50cm/20” and up.

### **18.1 Where the rucksack load is carried**

The strongest muscles in your body are in your legs, so you want to carry the weight of your rucksack through your legs **AND NOT** your shoulders.

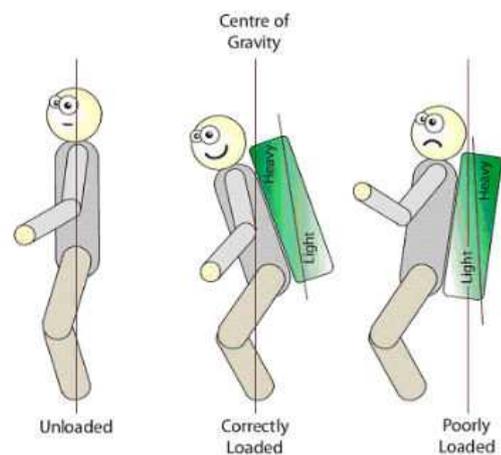
If your rucksack's waist band is too high the weight will load onto your spine (i.e. the band in red).



The correct position will transfer the weight straight onto your pelvis and thus through to your legs (the band in green).

The aim is to have the weight distributed 70-80% on the hips, 20-30% on the shoulders. The pack should be comfortable, stable and be sat close against the back.

### **Balancing the rucksack & centre of gravity:**



**This diagram indicates how you need to pack heavy objects near to your back and high up. Otherwise your centre of gravity is affected.**

## **18.2 Tightening the straps**

Once you have set the correct back length we can begin fitting the pack to there back.

1) When the pack is on your back, you need to get the hip belt fitted correctly and in the right position. The hip bone (Iliac Crest) should be between half and three quarters of the way up the hip belt. The hip belt should then be tightened.

Make sure the webbing does not slip through the belt buckle. Some cheaper buckles are too slippery and just means you end up carrying the load on your shoulders.



2) Once the hip belt is tight. Tighten the shoulder straps so the pack hugs the back. There should be no gap between the back and the pack. The shoulder straps should follow the curve of the shoulder with no gaps. The shoulder strap yoke should be 1.5"- 2" below the c7 vertebrate (the knobby bone).

You may have to adjust the back length on packs that have an adjustable back system please refer to the relevant manufacturers details on adjusting these.



3) You can use the tension straps on the shoulders and waist belt to tailor the fit for yourself. The shoulder tension straps should be between 20 and 30 degrees. Pulling the shoulder straps tight will bring the weight up on to the shoulders. The weight should be dispersed 70% on the hip 30% on the shoulders.



4) If there is too much weight on the shoulders release the tension straps on the harness and tighten the tension strap on the hip belt, this will bring the weight down into the hip area once this is done you can put the tension back on to the shoulders being careful not to bring too much weight from the hip.



The order in which you fit your rucksack is important, we recommend doing it the following way to ensure the rucksack is the right one for you.

The waist belt should be tight (and still comfortable), bearing in mind the positioning of the belt in reference to the crest of the hip.

You should then fit the shoulder straps and tighten them.

Following this, the waist belt stabilizers should be adjusted for maximum comfort on your hips and until firm.

After the waist, the shoulder strap stabilizers should be adjusted. This will bring the whole pack into balance. **Do not over tighten** the shoulder stabilizers as this may create a gap between the shoulder and the shoulder strap which will cause rubbing and overbalancing of the rucksack once you start walking.

The final process to undertake is to clip and adjust chest strap. This can be uncomfortable if placed in the wrong place, especially for women. The strap should fit level with the front of the shoulder joint and tightened until it takes the pull off the front of the shoulder.

### **18.3 Common mistakes while fitting your rucksack**

The back length is set too long leaving a gap behind the shoulder.

The back length is set too short putting too much weight on the shoulders and leaving the waist belt too high up the body.

To test the weight distribution you can follow the following instructions:

If you get someone else to grab the waist belt firmly and shake it, you should move with it, and not stay rigid.

If someone pulls the shoulder straps apart they should move but give some resistance.

**Top Tip:**  
**When packing a rucksack, pack items into plastic bags (perhaps use shopping bags). So socks and underwear in one, thermal in another etc. Makes it easier to find them later when you have less light.**

## 19. Emergency Procedures

Getting help

Recording details

Phoning/radio over the correct details

Ground crew instructions for helicopters etc.

### 19.1 Signs to helicopters

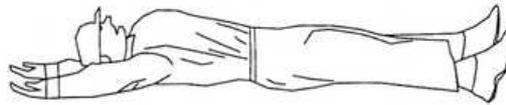
Hopefully you will never have to do it but you should know how to signal a rescue helicopter if they are trying to rescue you.

V = need assistance,

X = require medical help,

N= Negative,

Y= yes)



**NEED MEDICAL  
ASSISTANCE-URGENT**

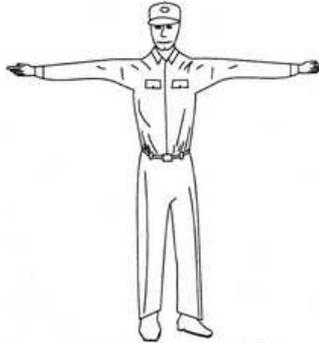
**Used only when life is at stake**



**ALL OK-DO NOT WAIT**  
Wave one arm overhead



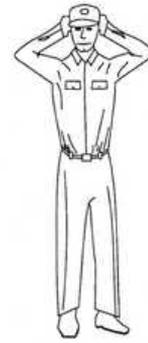
**CAN PROCEED SHORTLY  
WAIT IF PRACTICABLE**  
One arm horizontal



**NEED MECHANICAL HELP  
OR PARTS - LONG DELAY**  
Both arms horizontal



Make throwing motion



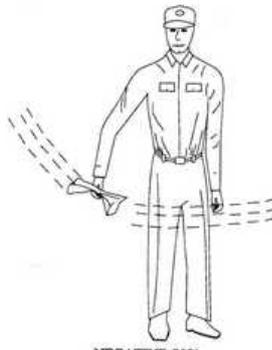
**OUR RECEIVER IS  
OPERATING**  
Cup hands over ears



**DO NOT ATTEMPT  
TO LAND HERE**  
Both arms waved across face



**LAND HERE**  
Both arms forward horizontally,  
squatting and point in direction  
of landing - Repeat



**NEGATIVE (NO)**  
White cloth waved horizontally

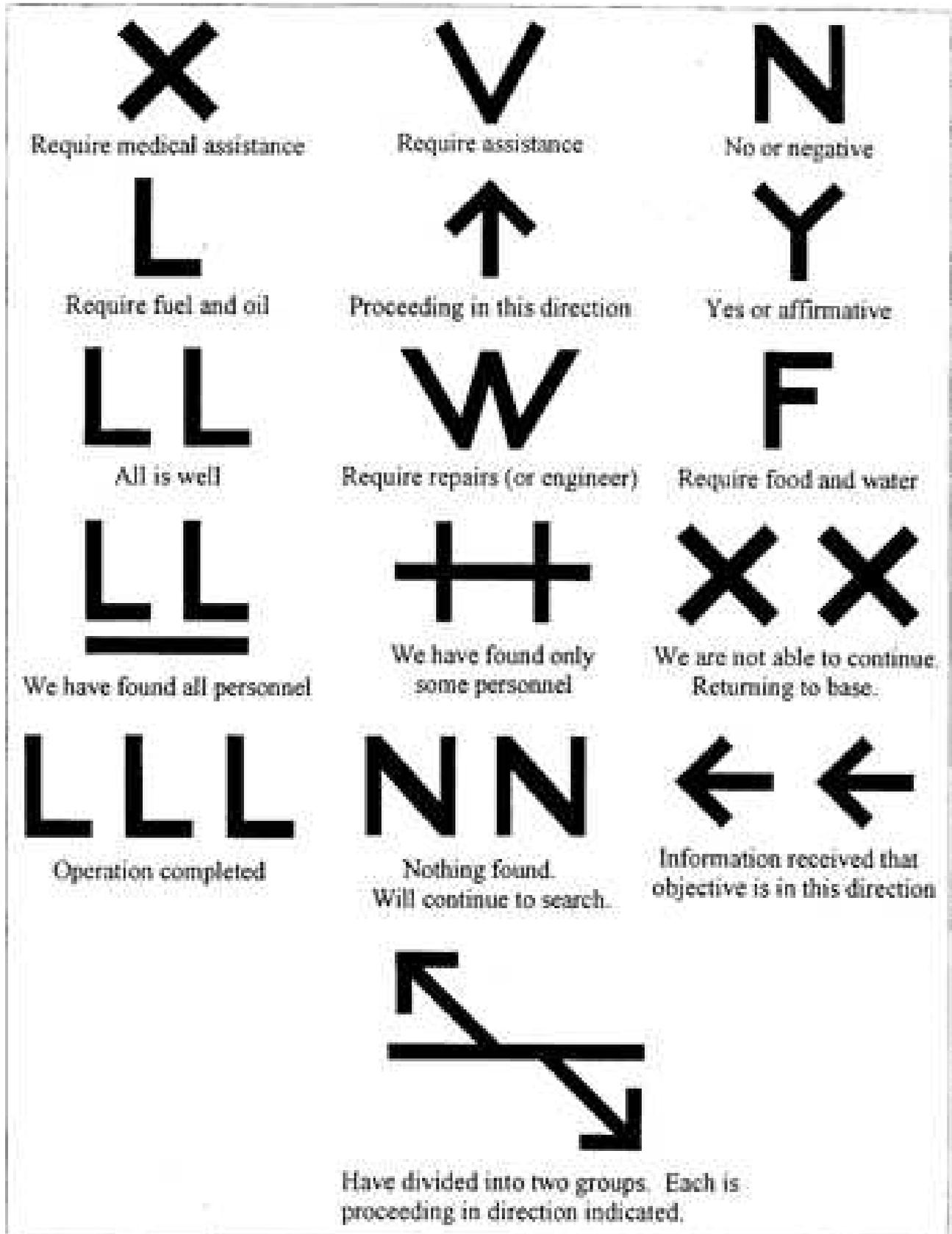


**AFFIRMATIVE (YES)**  
White cloth waved vertically



**PICK US UP-  
PLANE ABANDONED**  
Both arms vertical

Make the following signs with anything to hand. For example: clothes, soil, hay, stones.



Note order of message: LOCATION, DESCRIBE INJURY, TIME OF ACCIDENT/INCIDENT, NAMES OF INJURED, NAMES OF REST OF PARTY

#### EXERCISE:

Using a local map, split into small groups of 2–4's. Go to various areas & radio back a message using the phonetic alphabet. The incidents should be an injury one of the group. Someone will be in the pavilion-taking message and to confirm their position.

Resources

Local Maps

Radios

### **19.2 Procedure in The Event of an Accident or Illness**

Do any immediate First Aid that is necessary. Stop any bleeding by applying clean dressings and bandaging firmly. If patient is unconscious, make sure that he is not choking with his tongue blocking up the back of his throat.

Make the patient as comfortable as possible and treat for shock. Keep him warm, putting spare clothing etc. as insulation underneath him.

Give the International Distress Signal – You give 6 loud short blasts on your whistle, or 6 flashes on your torch, then wait for a minute and repeat. Keep repeating this sequence until you feel that there is definitely no one going to respond or until you hear a response. The response is 3 short blasts, or flashes, then a minutes break and repeated.

If your signal does not produce assistance, two of the party must go down and contact the nearest Mountain Rescue Post. You should already be familiar with these; they are marked on the map, and are also listed in the back of Rock Climbing Guide Books, though locations sometimes change and should be checked. The messenger must carry and give the following information concerning the accident:

- Exact position, giving six-figure grid reference or, if this is not feasible, as much information as possible to enable a rescue party to go straight to the injured person.
- If a rock-climbing accident, he must know the name of the cliff, the route, and the pitch, so that the rescue party will know whether to approach from the bottom or the top.
- Time of the accident.
- How many people are injured.
- Nature of the injuries.

So far, I have dealt just with mountain hiking, but as you can gather, most of the precautions apply to almost any activity, whether you go hiking, caving, pot holing, canoeing, sailing, swimming, or what ever you may choose to do. Namely, tell some one when, and where you are going, who is

going with you, and how long you intend to be. Take the right equipment and check it for its quality, and never go in parties of less than four. Then, if you get into trouble, you can support each other. As someone knows where you are, if you do not move, then when you do not return at the right time, they will know where to come and look for you.

#### BEFORE YOU GO

Learn the use of map and compass  
Know the weather signs and local forecast  
Plan within your capabilities  
Know simple first aid and the symptoms at exposure  
Know the mountain distress signals  
Know the Country Code

#### WHEN YOU GO

Never go alone  
Leave written word of your route and your return  
Take wind proofs, woollens and survival bag  
Take map and compass, torch, whistle and food  
Wear suitable footwear  
Keep alert all day

Our mountains are a common heritage. They provide a haven of peace and beauty for all who seek it, a playground for many, a means of livelihood for some, a last refuge for certain wild animals and plants. In these and other ways, the mountains are an important part of our national life.

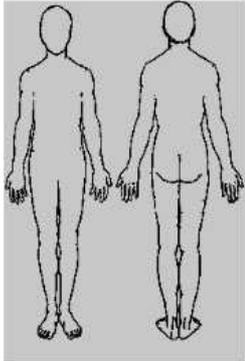
**It is up to us to conserve this heritage for the benefit of ourselves and other people, and for the enjoyment of future generations.**

### 19.3 Casualty Medical Card

This is a card that should be completed on finding a casualty. It should be updated regularly and go with the casualty when they get passed on to other medical staff. You may want to make a copy before it is passed on.

You may want to create your own card. Readings should be made ever 10 mins or depending on the seriousness of the injury.

CAS NAME		AGE/ DOB	SEX
Hazard			Safe to approach ?
			What happened ?
History			Contact Assist ?
Help			Check Clear Maintain
Airway			Rate, Depth, Ease ? Check whole chest
Breath			Pulse Control Control big bleeds
Circul			Alert      Pupils Voice      L      R Pain Unres
Disabil			Cover Insulate Protect
Environ			

2nd Survey	Time								
	Pulse								
	Resp								
	BP								
	Cap Ref								
	AVPU								
Pupils									
Expose and Examine	Findings and Treatments:								
									
	# Fracture      O Open B Bruise      C Closed D Deformity      W Wound F Fmg Body      S Swelling P Pain								
	Next of Kin contact:								
F. Aider:					Date:				
Witness					Tel:				
Witness					Tel:				

## 20. First Aid & Conditions Associated with Expeditions



Realistically, what might go wrong on an expedition?

- twisted ankle (carrying a full loaded rucksack)
- head injury from falling onto a rock
- breaking a limb (serious)
- internal bleeding (serious)
- Hyperthermia
- impalement
- generally do not give first aid tuition. Put them on a course!

The Senior Scout Ambulance Badge is currently:

‘Content of an emergency first aid at work course’ (the one day course)

Which is:

On completion of training, successful candidates should be able to:

- Understand the role of the First-aider including reference to
  - the importance of preventing cross infection;
  - the need for recording incidents and actions;
  - use of available equipment; –
- Assess the situation and circumstances in order to act safely, promptly and effectively in an emergency
- Administer First aid to a casualty who is unconscious (including seizure);
- Administer cardiopulmonary resuscitation;
- Administer First-aid to a casualty who is choking;
- Administer First-aid to a casualty who is wounded and bleeding;
- Administer First-aid to a casualty who is suffering from shock;
- Provide appropriate First aid for minor injuries  
(including small cuts, grazes and bruises, minor burns and scalds, small splinters).

## **Conditions associated with expeditions**

### **20.1 Hypothermia/ Exposure, or Wet/ Cold Exhaustion**

Collapse and possible death from exposure is brought on by the failure of the person to maintain body core temperature, either by keeping himself dry or by maintaining a high enough work output, with its accompanying warming effect. Consequently, it should be appreciated that a tired, frightened or hungry walker, carrying even a light load who is wet and cold through to the skin is a possible victim of exposure, especially if the air temperature should fall to near zero centigrade.

#### **Signs and symptoms**

It is not easy to recognise a mild case of exposure in a party, and yet it is extremely important that the signs of a Scout approaching a crisis are not overlooked. The following are among the most usual symptoms of which any may be present:

- A slowing of the rate of progress with complaints about coldness and tiredness.
- Clumsiness and stumbling with failure to respond to simple directions and mental lethargy.
- Disturbance of speech and/or vision.
- Sudden shivering fits.
- Collapse.
- Irrational or unreasonable behaviour.
- Argumentative: sudden bursts of energy.

In view of the relatively short period of time (between 1 and 2 hours) between the onset of the symptoms and collapse it is essential that urgent and correct action is taken.

The condition of the Scout must not be allowed to deteriorate further, and this means that pressing on is NOT the answer, unless shelter is only minutes away. Once the victim is only capable of low level physical activity the time has come to STOP and make some sort of camp on the spot. If possible a tent should be erected, failing this a temporary shelter must be erected using whatever is available.

#### **Treatment**

The following treatment should then be given:

- STOP AT ONCE.  
Do not allow serious disability or collapse to develop. See Accident Procedure below.
- Insulate the victim against further heat loss i.e. put him into a man-sized polythene survival bag and sleeping bag, with further padding underneath it. If possible place another fit person in with the casualty or close alongside for warmth. Make the whole set-up as windproof as possible.
- Give the victim food and warm drinks if a stove is available.
- Reassure the patient - fear greatly accelerates exhaustion.
- Follow ACCIDENT PROCEDURE

This activity is directed at

- (1) preventing further loss of body heat and
- (2) raising the body core temperature.

NO ATTEMPT EITHER BY RUBBING, HOT WATER BOTTLES OR ALCOHOL SHOULD BE MADE TO WARM THE SKIN OF THE VICTIM; this would only cause a rush of blood to the skin and further core cooling. When the stretcher party arrives all the insulation around the victim should be preserved during the carry.

On arrival at suitable access/ escape point get medical assistance for the casualty.

### **Feet conditions**

On expedition, your feet are the most important parts of your body.

If they are cold and wet you will not be able to concentrate. If they are in severe pain you can easily become a casualty and will burden your team mates. Most feet problems are avoidable.

### **20.2 Plantar Fasciitis**

What is Plantar Fasciitis?



Plantar Fasciitis (PLAN-tur fas-e-I-tis) is the name given to the inflamed condition of the connective tissues called the "plantar fascia" that supports the arch of your foot.

The Plantar Fascia attaches to the heel bone and then splits into several thinner bands, as it reaches towards the toes

#### **Causes of Plantar Fasciitis**

Strain and stress to this band of fibrous tissue can be caused by sudden changes in weight bearing motions during sports activities, a weak flat foot, abnormal pronated conformation, wearing shoes with little or no arch support, tight calf muscles, extended hours of standing on a hard floors and being obese.

It can also be created by having tight calf muscles or a sedentary life style. Before exercise, make sure you warm up, and warm down afterwards.

For many people, the condition is worse in the morning, when they first get out of bed and try to stand up.

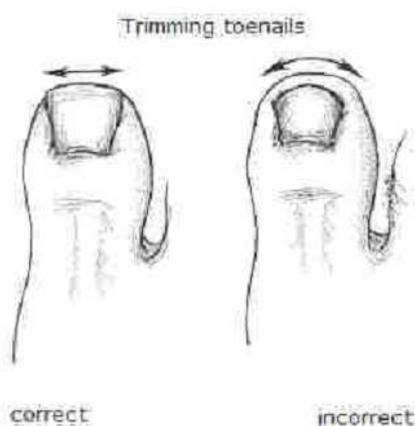


During the night your foot and ankle relax and the plantar fascia shortens a bit, so when you try to stand up and put weight on your feet...the inflamed tissues doesn't stretch very much and you feel the pain.

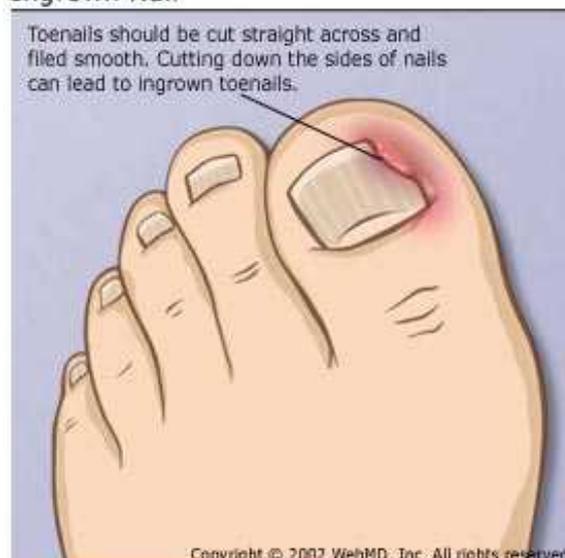
This condition may come about from wearing old exhausted foam sole trainers/ shoes/ boots. Where the foam around the heel has collapsed and allowed your ankle to sit at an odd angle.

You will probably need to seek specialised advise but it is worth making sure all your shoes & boots have a proper arch support. If not you can purchase some inserts.

### **20.3 In-growing toe-nails**



### **Ingrown Nail**



Boys aged between 13-21 are the most at risk group to get 'in growing' toe nails.

What is it?

It is when the toe nail digs into the skin around the nail.

This can happen

a) when it is badly cut and leaves a jagged edge that cuts into the surrounding tissue and becomes infected. It is not that serious but would seriously affect your expedition experience.

It can also occur if your toes nails 'curl' up at the sides. This curling can only be treated by an operation to cut out that part of the nail . Therefore do not 'pick' your nails.

### **20.4 Blisters**

Blisters are caused by rubbing of the skin. Usually a foot moving too much against the boot inner. They are a different body reaction to a cut of the skin where blood is produced.

The blister is a cushion for damaged skin underneath.

Prevention:

- firstly – try to avoid getting blisters in the first place (proper fitting boots socks etc)
- use a tape (perhaps zinc oxide or '2<sup>nd</sup> skin') to tape over an areas that are prone to blisters
- stop before a blister forms. At the 'hot spot' stage. Prevent blister forming.

- if you get a blister, put a plaster on it and keep it clean.
- DO NOT PUNCTURE IT – it could get infected.

The following 1<sup>st</sup> picture shows a burst/ripped large blister on the back of the heel. The second shows 50mm wide zinc oxide tape around a foot covering some common blister points.

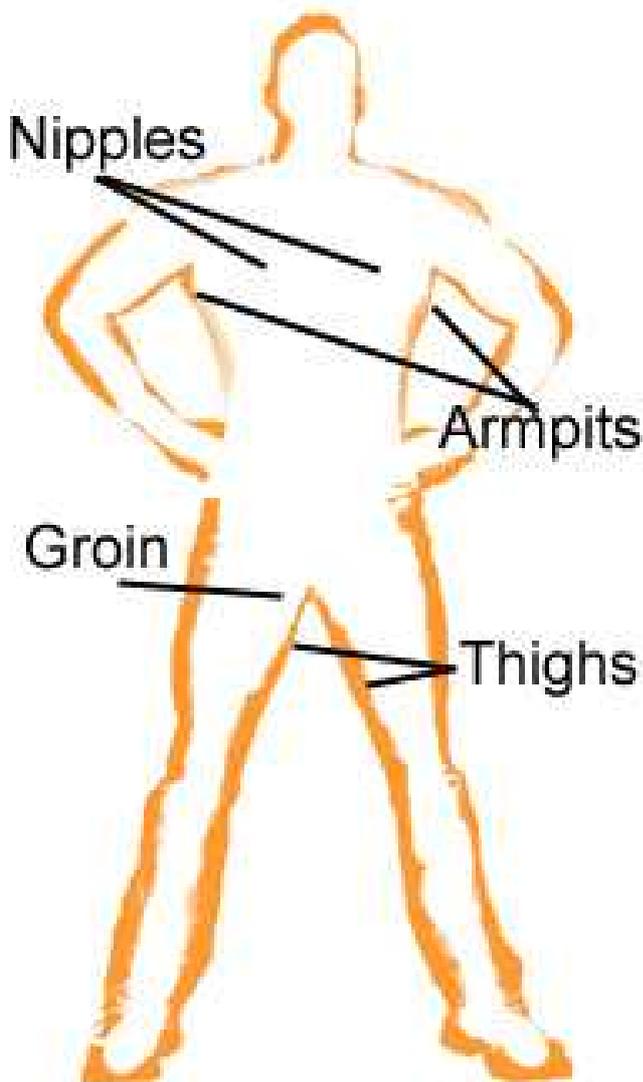


You need to be cautious if you apply tape, so that blood supply is not affected.

To check the circulation you press one of the nails, or skin of the hand or foot, until it is pale. If, on releasing the pressure, the colour does not return, or returns slowly, the bandage may be too tight.

Loosen tight bandages by unrolling just enough for warmth and colour to return to the extremity. The casualty may feel a tingling sensation. Re-apply the bandage as necessary and keep rechecking for circulation.

## 20.5 Chaffing



Chafing is more likely to occur at these locations.

Chafing is one of those uncomfortable things that can happen to anybody, but it's far more common in people just starting an exercise program. First time joggers, runners, even someone who's just getting out and walking a little more than normal can be affected.

On an expedition, chaffing can become so serious that the person may not be able to walk or carry a load. Extraction of the person may be the only reasonable course of action.

### Cause:

Chafing is caused by the sweating and friction of body parts rubbing together or clothing rubbing away at you. Eventually the skin becomes red, irritated and raw. Common symptoms include a stinging or burning sensation. Most of the time it happens in the armpits, groin area, inner thigh and on the nipples. Fortunately you can prevent it. You just have to do a few things before you start.

### Prevention Strategies:

#### Drink plenty of water.

If you stay hydrated you can perspire freely as you get warm. Perspiration keeps your skin lubricated. If you get dehydrated, the sweat evaporates and leaves behind tiny salt crystals. Dry, salty skin that's rubbing together will eventually become raw and chaffed skin.

#### Apply deodorant lightly.

When you put it on heavy, it becomes sticky and can actually create a problem.

#### Wear clothing that's snug (not tight) and slippery.

The ideal fabrics are ones that help with heat loss and evaporation. Skip the cotton because it retains water and rubs against the skin. Men should consider boxer-briefs instead of briefs and women should dump the pantyhose, they don't let skin breathe.

#### Look for synthetic fabrics

...like ClimaLite, CoolMax, Ingeo, PrimaLoft, Sensura, Thermax, Thorlon and Wonder-Wick. They're designed to draw the salty sweat away from skin and provide less friction as body parts rub against each other.

Inspect the clothing before you buy it.

Choose clothing with fewer seams,

seams that are flat and small stitching. Wash it once before you wear it. Then test it on a shorter walk or run before you fully commit to using it.

Ace bandages or elastic wrap can help by preventing friction.

A common place for chafing to occur is the inner thigh, so putting a wrap around each thigh will prevent them from rubbing together. This is especially effective for people who may be a little larger.

Clothing alone may not do the trick, you might have to add an ointment.

Cortisone cream, Noxzema, Vaseline and Zinc oxide ointments are all used in areas of repeated chafing. But use them with caution. If you're hairy, greasy ointments can clog hair follicles and produce more irritation.

Long distance runners should look for stronger lubricants.

Petroleum jelly is popular because it's easy to find and cheap, but it may not stay on as well as professionally designed products. For serious slipperiness, consider Bag Balm, Body Glide, Chamois BUTT'r, Lube Stick for Runners or Sportslick. (I have never heard of any of these trade names)



Some people only have problems with their nipples getting raw. A simple band-aid over each one is cheap and may be sufficient. You can also look for specialized products like NipGuards for more advanced protection.

If your skin gets chaffed, you have to let it heal.

Clean it with soap and lukewarm water and then apply an antibacterial ointment or antiseptic spray. A+D Ointment is a favourite among runners. Then leave the area uncovered for fastest healing. If it's an area that has to be covered, protect it with a band-aid or sterile gauze so your clothing won't continue irritating things. Take a break from whatever activity caused it and your skin should recover in a couple of days.

Irritated skin that's still a problem more than two days after the rubbing has stopped might have become a fungal infection. If it's happened before and you recognize the symptoms, an antifungal medication like Lotrimin should clear it up. If you aren't positive, get a professional opinion. Applying an antifungal medication to a nonfungal problem can easily make things worse.

Walking, jogging or running are all great ways to get in better shape. But like any physical activity, you have to spend a little time beforehand getting the right gear and preparing your body.

## **21. Personal Hygiene**

Why important?

Minimum requirements : feet, teeth, etc

Foot care !!!!

Take a 'jay cloth' with you. It makes a great towel – just wring out several times. It is very cheap.

## **22. Section Deliberately Left Empty**

## **23. Legislation and the Countryside**

Countryside Rights of Way Act (CROW) was created to give access to large parts of land in the UK. Newer OS maps now have Access Land as defined by CROW outlined in faint orange.

Therefore on access land, it might reduce soil erosion if you keep well off the established paths.

## **24. Practical camp skills and discipline**

Keep rubbish with you. – How to dispose of any other rubbish.

Choosing a campsite, arrangements for water, cooking, sanitation, refuse disposal, fire precautions.

Pitching and striking tents

## **25. Assessors report**

This report should be factual and fair to reflect the experience of the expedition participants.

Provide some example text here.

## **26. DofE Official Training Syllabus for all Levels**

### **First Aid and Emergency Procedures**

Training based on the current edition of the Authorised Manual of St. John Ambulance, St. Andrew's Ambulance Association or The British Red Cross.

- Action in an emergency – resuscitation, airway, breathing and circulation.
- The treatment of wounds and bleeding.
- Treatment for shock.
- The treatment of blisters, cuts, abrasions, minor burns and scalds, headaches, insect bites, sunburn, splinters.
- The recognition of more serious conditions such as sprains, dislocations and broken limbs.
- Knowing what to do in the case of an accident or emergency.
- Summoning help - what people need to know, telephoning for help, written message.
- Getting help, self-help and waiting for help to arrive, keeping safe and warm, helping people to find you.

#### **GOLD:**

- The emergency transport of casualties.
- The recognition, treatment and prevention of hypothermia.

### **An Awareness of Risk and Health and Safety Issues**

- Expedition fitness.
- Telling people where you are going.
- Identifying and avoiding hazards.
- Keeping together.
- Weather forecasts - knowing how, where and when to obtain weather forecasts, relating weather forecasts to observed conditions, looking for signs which will indicate changes in the weather.

#### **GOLD:**

- Undertaking a risk assessment.

## Navigation and Route Planning

In normal rural country, all route finding should be based on the map alone.

Using a compass in rural country devoted to agriculture, with its hedges, meadows and fields under crop, is inappropriate and unnecessary. It causes ill-feeling with the farmers, hinders young people in developing a sense of direction and impedes their map reading skills.

The 1:25 000 scale Explorer maps, available for the whole of England, Scotland, Wales and parts of Northern Ireland, should be used as they make instruction and learning easier. They show the field boundaries, making it easier to locate precisely the footpaths, tracks and lanes used for travel in this type of country, so helping to reduce friction with landowners. Participants should also be familiar with the 1:50 000 scale Landranger maps.

Memory-Map is the Recommended Route Planning Tool for the Duke of Edinburgh's Award and can provide complete GB coverage of OS Explorer 1:25,000 and OS Landranger 1:50,000 mapping. Bronze Award Groups which undertake expeditions in large areas of woodland or forested areas may wish to use the full compass syllabus of the Gold level of the Award.

SILVER: in normal or open country, most route finding should be based on the map alone.

### GOLD:

The 1:25 000 scale Outdoor Leisure or Explorer Maps, available for the whole of England, Scotland and Wales and parts of Northern Ireland, should be used wherever possible as it makes instruction and learning easier. They show the field boundaries, making it easier to locate precisely the footpaths, tracks and lanes used for travel in this type of country, so helping to reduce friction with landowners.

## Preparatory Map Skills

- The nature of maps.
- The use of 1:25 000 Explorer, 1:50 000 Landranger or the relevant maps in Northern Ireland and abroad.
- Map direction.
- Scale and distance, measuring distance, distance and time.
- Conventional signs..
- Marginal information.
- Grid references.
- A simple introduction to contours and gradient.
- The ability to give a verbal description of a route linking two places from the map.

### GOLD:

- Understanding contours, recognition of major land forms such as hills, valleys, ridges, spurs.

Interpretation of contours into mountain land forms and relief, slope and gradients and the determination of height.

## Practical Map Skills

- Setting the map by inspection (two methods).
- Locating position from the map.

- Determining geographical direction and direction of travel from the map.
- Checking the direction of paths using the set map.
- Identifying features in the countryside by using the map.
- Locating features marked on the map in the countryside.
- Planning a route, preparing a simple route card.
- Following a planned route.

**SILVER:**

- Relating the map to the ground and estimating speed of travel and arrival times.

**GOLD:**

- Identifying **and locating** features in the country by using the map.
- Relating the map and contours to the ground. Estimating journey times in wild country.
- Planning a route, preparing a route card. Estimating speed of travel and arrival times. (ETA estimated time of arrival).
- Navigation in restricted visibility. Action to be taken in the event of being lost

### Compass Skills

The introduction of the compass at Bronze level should only be at a basic level. It should not be introduced until the participants have mastered the techniques of finding their way using the map alone.

- The care of the compass.
- Direction from the compass in terms of the cardinal and the four intercardinal points.
- Setting the map by the compass where magnetic variation may be ignored.

**SILVER:**

The compass should not be introduced until the participants have mastered the techniques of finding their way using the map alone.

- Measuring direction in degrees.
- Setting the map by the compass where magnetic variation may be ignored.
- Determining the direction of footpaths or direction of travel.
- Travelling on a bearing. Obtaining a grid bearing from the map, allowing for magnetic variation where appropriate.
- The influence of ferrous objects and electromagnetic fields.
- Magnetic variation and the relationship between True, Magnetic and Grid North's.

**GOLD:**

- Traveling on a bearing. Obtaining a grid bearing from the map, allowing for magnetic variation where appropriate

### **Camp Craft Equipment and Hygiene**

- Choosing suitable clothing, footwear and emergency equipment and knowing how to use it.
- Choosing and caring for camping gear.
- Packing a rucksack, waterproofing the contents, always keeping the weight down to a minimum, and about a quarter of the body weight when walking.
- Choosing a campsite, arrangements for water, cooking and sanitation, refuse disposal, fire precautions.
- Pitching and striking tents.

### **Food and Cooking**

- Cooking and the use of stoves, safety procedures and precautions which must be observed when using stoves and handling fuels.
- Cooking simple meals under camp conditions.

#### **SILVER:**

- Using dehydrated foods under expedition conditions.
- Cooking substantial meals under camp conditions.

### **Country, Highway and Water Sports Codes**

- Understanding the spirit and content of the Countryside Code.
- The avoidance of noise and disturbance to rural communities.
- A thorough knowledge of the content of the Highway Code with special emphasis on specific modes of travel such as horse riding or cycling if they are to be utilised during the venture.
- If undertaking a water venture, a thorough knowledge of the Water Sports Code.

### **Observation Recording and Presentations**

- Developing observation skills and different methods of recording information.
- Skills relevant to the method of presentation.
- Choosing a purpose.
- Researching relevant information.

#### **GOLD:**

Titled as 'Observation recording and purpose' – perhaps a typo?

### **Team-building**

Team-building should permeate all expedition training and can be enhanced through team-building exercises and regular reviews so that when the group sets out on the qualifying venture, participants are able to work together as an effective and cohesive unit.

Proficiency in the Mode of Travel

### **Cycling**

- Training to the standard of the National Cycling Proficiency Scheme and the Right Track Awareness Programme as appropriate.
- Maintenance and repair of the cycle.

- Loading a cycle with equipment.
- Handling a loaded cycle.
- The skills associated with off-road cycling as appropriate.

### **Horse Riding**

- Training to Pony Club 'C' standard, Riding Club Grade 2 or British Horse Society Progressive Test 10.
- A knowledge of tethering.
- Competent in ensuring the well-being of the horse for the duration of the venture.
- Be able to recognise dangerous going (route) and the action to be taken in the event of an accident to horse or rider.

#### **GOLD:**

- Training to Pony Club 'C+' standard, Riding Club Grade 3 or British Horse Society Progressive Test 12

### **Water Ventures**

Training should be directed towards the completion of a journey on water and not restricted to the skills of handling the craft. It must be concerned with any potential hazards associated with the water on which the venture will take place, as well as infections or health concerns related to any possible water pollution.

Participants must be able to swim a distance of at least 25 metres in light clothing without any buoyancy aid and be competent and confident in the relevant capsize and recovery drill and man overboard drill.

All participants must:

- Wear appropriate buoyancy aids or lifejackets. Exceptions may be made, with the approval of the Operating Authority, for rowing ventures on canals and rivers, and for sculling craft where traditionally, by custom and practice, life jackets are not usually worn, except on the instruction of the cox.
- Wear suitable clothing and footwear.
- Be able to recognise and treat hypothermia.
- Understand the Water Sports Code.

All craft must have adequate buoyancy and be sound, suitable and fitted out for the conditions in which they are to be used. A suitable repair kit must be carried and participants should be trained in its use.

### **Canoeing**

All participants must be adequately trained to:

- Satisfy the assessor as to their competence.
- Demonstrate that their equipment is waterproofed.
- Satisfy the assessor that their kayak or canoe, equipment and clothing are suitable for the venture.

Training must be aligned to the requirements for paddle expeditions.

## **Rowing**

All participants must undergo training based on the syllabus for Boat-work in this Expedition Guide or the training schemes of the Sea Cadets, Scouts or Girl guiding UK.

## **Sailing (Sailing dinghies or keel boats)**

For the Bronze Award, all participants must attain proficiency to the standard of the RYA National Sailing Seamanship Skills certificate.

### **SILVER:**

For Silver level, all participants must attain proficiency to the standard of the [RYA](#) National Sailing Seamanship Skills certificate and Day Sailing certificate.

### **GOLD:**

Silver requirements - AS A MINIMUM with additional training relative to the area of the proposed venture. LI

- OR -

RYA Day Skipper shore based and practical certificates (NB for expeditions in cruising yachts involving overnight passages in open sea areas, at least one crew member must hold the RYA/MCA Coastal Skipper Certificate as appropriate.