

# OUR TIPS FOR SUCCESS: YOUR DOFE EXPEDITION

Issue 3 - March 2024



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EQUIPMENT  
LIST  
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# BRONZE NAVIGATION

## TOP TIPS FOR SUCCESS:

- ➔ Know how to use 6 figure grid references.
- ➔ Use 100m pacing to measure distances as you walk.
- ➔ Know how fast you walk: you will walk at around 3 to 4km per hour, but you will need to add in time for unscheduled stops, looking at the map etc. so it will be closer to 3km per hour. You must also add one minute for every 10m of contour ascent – uphill only.
- ➔ Know how to set the map using the compass: place it flat on the map you're holding and turn your body so that the north (red) magnetic arrow (#5 in photo) points along the blue grid lines to grid north on the map. Everything in the landscape around you should then line up with the map in front of you.
- ➔ Know how to take a compass bearing: this is not essential at Bronze, but a great skill if you can pick it up. Place the compass on the map with the side of the compass and the direction of travel arrow (#1 in photo) pointing the way you want to go. Twist the compass housing (#6) until the orientation arrow (#4) is parallel with the blue grid lines on the map pointing grid north. Take the compass off the map and turn your body until the north (red) magnetic arrow (#5) lies above the orientation arrow ('putting the red to bed'). The direction of travel arrow (#1) will point where you want to go.
- ➔ Use tick features to keep track of where you are.

## ! THINGS TO AVOID !

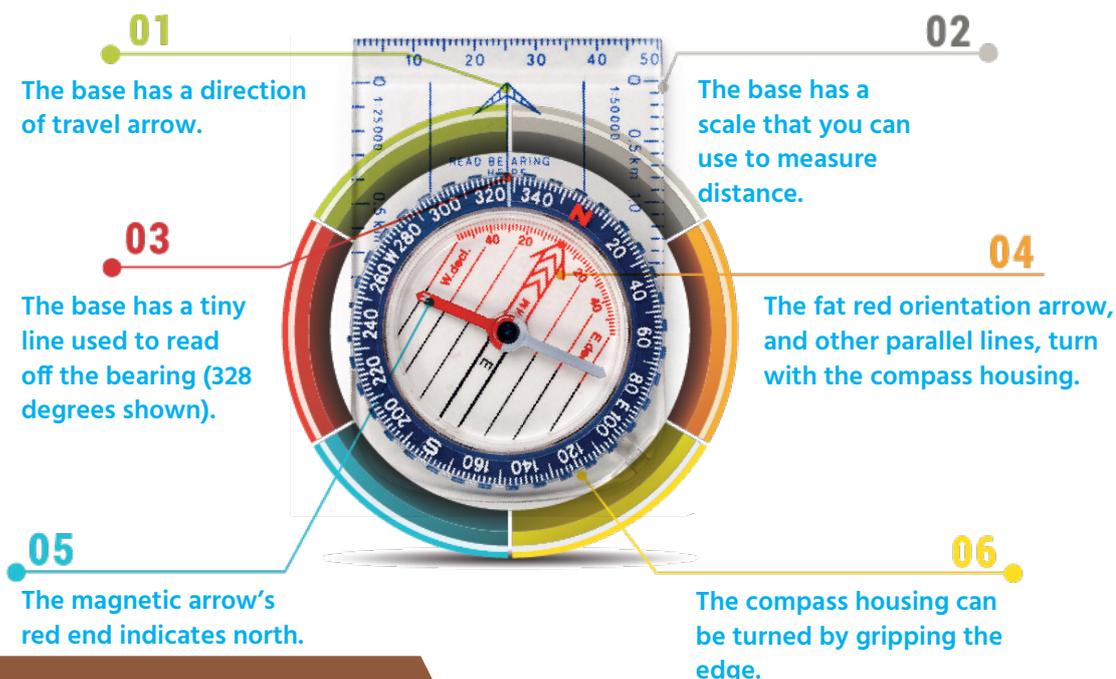
**WALKING WITHOUT A PLAN:** getting lost, and being too tired as a result, is a common problem.

**KEEPING YOUR COMPASS NEXT TO YOUR MOBILE PHONE:** this damages the magnetic needle.

**USING YOUR COMPASS WHEN IT IS NOT FLAT** in your hand and not perpendicular to your body.

## ? DID YOU KNOW? ?

- ➔ Maps show the landscape features in 2D.
- ➔ The scale of the map is usually either 1:25,000 which is used for navigation, or 1:50,000 which tends to only be for planning.
- ➔ The key to map symbols can be found in the margin on the edge of the map.
- ➔ The blue grid lines on all maps represent 1km squares, and their sides indicate north/south and east/west.
- ➔ The shape of the landscape is shown using contour lines.
- ➔ The closer they are, the steeper the ground. Lines may be shown every 5 or 10m – check carefully what scale it is on your map.
- ➔ Refer to your route card during the day for efficiency, to keep track of progress, and to alert you if you are running late.



### USEFUL WEB LINK:

[Ordnance Survey Map Reading video tutorials](#)

## TOP TIPS FOR SUCCESS:

Silver and Gold DofE Expeditions will be in more challenging landscapes and conditions than at Bronze.

Gold usually takes place in Wild Country areas, remote from habitation and unfamiliar to participants.

- Know how to correct your compass bearings for grid magnetic angle according to the map legend.
- Use pacing, timing, tick features, contours and overshoot/catching features as integral parts of your navigation.
- Be aware that on steeper or difficult ground your 100m pacing needs to be adjusted (possibly increased by 10-20 paces or more per 100m).
- Use teamwork: the main navigators on a leg can give tasks like pacing, or looking for tick features, to others in the team.
- Be wise to the use of attack points, aiming-off, back-bearings and handrails (linear features).
- Develop your understanding of complex shaped contours: when grouped in a v-shape, they indicate a valley or a ridge, but which? If you slide your finger forward into the 'v-shape' (>>) on the map and the contour values increase, this indicates your finger is tracking an ascent of a valley. If the value decreases, it is the descent of a ridge.
- Try to recognise more subtle map symbols like spot heights, rocky outcrops and marshy terrain.
- Practice using strategies such as leap-frogging in fog, and boxing around bogs.
- In harder terrain and poor conditions ensure you concentrate and use appropriate navigation techniques.
- Macro-navigation can be very useful: get your head up from your compass and look around you! Try and identify where you are going next.
- Have knowledge of more advanced techniques to use if you are lost such as using a compass to identify linear landscape features, re-section and aspect of slope.

### USEFUL SUPPORT DOCUMENT:

See our Appendix document on Navigation at the end of this booklet.

### USEFUL WEB LINK:

[Ordnance Survey Map Reading video tutorials](#)

✓ Make sure you are confident ✓ with all your Bronze skills from the Bronze sheet before tackling the following!

## ! THINGS TO AVOID !

**FIXING YOUR SIGHT ON THE COMPASS** – instead of on a distant object in open country.

**TACKLING A DIFFICULT** route card leg in one go – instead of breaking it down into mini legs.

**RELYING ON TOO FEW** navigators/compasses in fog or difficult terrain.

**RELYING ON JUST BEARINGS:** a recipe for disaster. Bearings only work when standing in the right place at the start! Also a few degrees off makes a big difference at the other end.



## TEST YOURSELF

- Practice near home with a compass before your qualifier ←

## ? DID YOU KNOW? ?

- Contours are your friends!
- Many other features in a landscape can change or be misrepresented (e.g. boundaries). Contour lines are very reliable and you should learn how to use them!

# EXPEDITION FOOD

- ➔ On a DofE expedition you are required to cook at least one meal each day, and carry individual emergency rations (that don't require cooking).
- ➔ You may need about 50% more energy than usual: depending on your size, between 3000 and 4000 calories each day.
- ➔ Attempt to keep your diet balanced: dried fruit snacks, and some fresh vegetables for the first night, can help.
- ➔ Use food rich in complex and simple carbohydrates, fats for energy, and rich in protein.
- ➔ Avoid nuts entirely if required by your school, or because of an allergy within your group.
- ➔ If you've never eaten a type of food/meal before ensure you test it at home, before the expedition, and that it's tasty – the right food makes a big difference to team morale!
- ➔ Reduce weight and litter by removing packaging (keep instructions!), cooking in groups of two or three, and using dried food. Decant food into zip-lock bags and plastic Tupperware.
- ➔ Pack the food for each day/meal together.

## BREAKFAST IDEAS

(should be substantial and relatively quick to prepare!): hot drink, porridge (instant/ quick cook), cereal with dried milk powder (just add water), pittas with jam, brioche and ready-made pancakes. Add interest to your porridge or cereal with nuts, dried fruit, hot chocolate powder etc

## SNACK IDEAS

Cereal bars, flapjacks, granola, oatcakes with cheese spread, dried fruit, nuts, trail mix, pepperami, malt loaf, biscuits and chocolate bars. Eat snacks throughout the day.

## ! THINGS TO AVOID !

Bringing **FOOD THAT WILL NOT KEEP**, especially in hot weather.

Bringing **TINNED food or GLASS jars**.

Bringing **FOOD THAT IS COMPLICATED** or takes ages to cook.

Snacking on **TOO MANY SWEETS** (simple carbohydrates, fast release sugars) and not enough **complex carbohydrates** (slow release). Fast release sugars give a 'low' later.

Ready-made meals are very quick and convenient. Dehydrated food is lightweight (but generally a bit more expensive and often requires boiling water). Hydrated boil-in-the-bag meals are cheaper, and can often also be eaten cold, but are heavy and so not recommended for every night. Below are some suggestions for other foods:

## LUNCH IDEAS

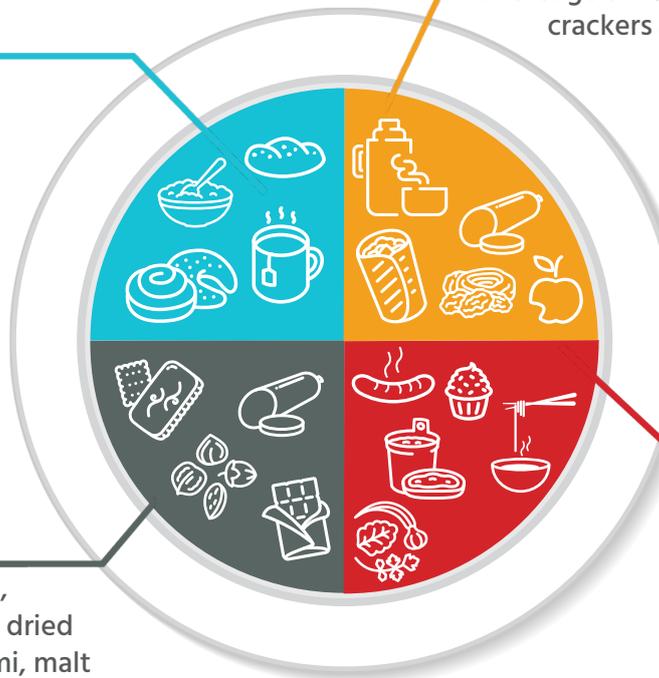
(Complex carbs and protein-rich fillings) – stoves should NOT be used at lunchtime: wraps, pittas and bagels won't squash like bread, and oatcakes, crackers and crispbreads will keep well.

(Fillings can include tuna sachets, hummus, tubes of squeazy cheese, sachets of peanut butter, honey, dried/cured meats e.g. pepperami, chorizo and jerky. Pasta/couscous etc. made the night before or in the morning – you can even keep soup etc. warm all day in a flask.

## EVENING MEAL IDEAS

Starter of instant noodles or cup-a-soup; main course of quick-cook pasta, rice, cous-cous, dried mashed potato or explore alternatives such as bulgar wheat or quinoa.

Add a lightweight sauce e.g. dried soups (use less water) or sauces purchased in plastic pouches. Add interest with pumpkin or sunflower seeds, herbs and spices, grated parmesan etc. Dessert of cakes with instant custard or Angel Delight (made with instant milk powder).



## USEFUL WEB LINK:

[DofE expedition food advice](https://www.learn-outdoors.co.uk/dofe-expedition-food-advice)

# CAMP COOKING WITH STOVES

## GENERAL COOKING PRINCIPLES

- PLACE YOUR STOVE AT LEAST 5 METRES AWAY FROM YOUR TENT.
- ANYONE NEAR THE LIT STOVE MUST WEAR BOOTS: never wear flip flops, or bare feet.
- CHOOSE A LOW, FIRM AND LEVEL SURFACE AWAY FROM ANYTHING THAT MIGHT CATCH FIRE e.g. long, dry grass
- PLACE STOVES NEAR A BARRIER, LIKE A WALL, IF POSSIBLE: this protects the stove from wind and prevents people gathering around or stepping over the cooking area, which is dangerous.
- Bring matches in a waterproof container or sealed bag, or use a 'Firesteel' (with gas).
- Gather together all your pans, water and food before you start cooking.
- Team members who are not cooking should sit and eat away from the stoves.
- Crouch or kneel down on one knee when cooking.
- Use the frying pan as a lid to increase efficiency.
- Use the pan handle when moving pans and lids, even if you think they are cold.
- KNOW WHAT TO DO IF SOMEONE GETS BURNED.

## COOKING WITH GAS STOVES

- TAKE SUFFICIENT GAS cylinders on your expedition.
- CAREFULLY SEPARATE THE GAS cylinder from the stove before packing it away.

### USEFUL WEB LINK:

[Stove safety instructions, from the DofE](#)

## ! THINGS TO AVOID !

- LEAVING THE STOVE unattended when it is lit
- PUTTING AN EMPTY PAN on a lit stove: it will overheat and possibly melt!
- STEPPING OVER stoves
- SITTING CROSS-LEGGED next to a stove
- NOT WASHING pots and pans after use
- LEAVING YOUR COOKING area untidy overnight

## CAMP COOKING WITH METHYLATED SPIRIT (METHS) STOVES

- TAKE SUFFICIENT METHS fuel on your expedition.
- YOU MUST HAVE A FUEL DUMP at least 5 metres away from the stove and the tents.
- KNOW WHAT TO DO IF THE STOVE FLARES UP, AND SOMEONE GETS BURNED.
- FILL THE BURNER TO ABOUT  $\frac{3}{4}$  FULL: To check if the burner is alight, start with your hand high and lower it gradually.
- USE THE SIMMERING RING TO CONTROL OR EXTINGUISH THE FLAME.
- IF THE STOVE RUNS OUT OF FUEL, THE BURNER MUST BE COOL BEFORE IT IS REFILLED: Take any pan off, wait several minutes, then carefully pick up the burner and take it to the fuel dump to pick up more fuel. NEVER BRING THE FUEL TO THE BURNER!
- When finished, BURN OFF EXCESS FUEL to heat water for either a warm drink, or to help wash your pans/plates.

# PACKING A RUCKSACK

## ! THINGS TO AVOID !

**RELYING ON YOUR RUCKSACK RAIN COVER** to keep everything dry; it really won't! You must line your rucksack with a dry bag, a large heavy duty rucksack liner or rubble sacks, and additionally pack your sleeping bag and clothes inside separate sealed waterproof bags or rubble sacks.

Don't forget to carefully waterproof your sleeping mat if it is on the outside of the rucksack.

**RELYING ON BIN BAGS** for waterproofing; they tear easily.

**PACKING LOTS** into one or two rubble sacks – you will have trouble finding stuff in the chaos.

**HAVING KIT SWINGING** on the outside of your rucksack: this puts you off-balance, is tiring, and you might lose things.

**USING YOUR MAP CASE AS A HANDBAG:** the map is likely to get wet-through if you keep going in and out!

## DID YOU KNOW?

→ A Rucksack has 4 sections

01

### BOTTOM OF THE RUCKSACK

Pack items you will not need during the day.

This is basically your sleeping bag, but other items such as a tent flysheet or clothes could go here if you have room.

In most rucksacks this is a separate section, allowing easy access at camp.

02

### MIDDLE OF THE RUCKSACK

Pack bulkier and heavier items, such as cooking stoves, gas canisters, food, tent parts and clothes.

Always try and pack the heaviest items towards the top of this section and close to your back for balance.

You can pack clothes around items to stop them rattling around.

03

### TOP OF THE RUCKSACK

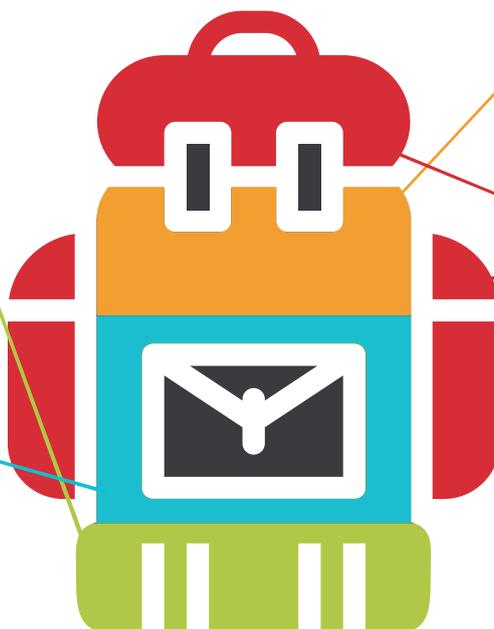
Pack bulky, lightweight items that you may need during the day, such as a fleece, waterproof jacket and trousers, survival bag/shelter and first aid kit.

04

### SIDE AND TOP POCKETS

Pack smaller things that you will need during the day or that you might need in a hurry, such as water, snacks, lunch, map, compass, whistle, torch and batteries, mobile phone, blister plasters and sun hat/sunscreen.

Also consider keeping a side pocket free for your meths bottle if using one.



## TEST YOURSELF

→ Do you know where to pack the heaviest items? ←

### USEFUL WEB LINKS:

[Rucksack advice from the DofE](#)

# TEAM GOAL

## TOP TIPS FOR SUCCESS:

Your assessed expedition must have a clear goal– at Bronze, this can be set by the leader.

The goal will be presented as a project at the end of the Silver/ Gold expedition, either as individuals or as a team. Presentation at Bronze level is optional.

Choose the format of your presentation: e.g. a story-board, a poster, use ICT, presentation to staff, parents or peers

- Choose a goal that makes the most of the abilities and interests of your group: it should be enjoyable for you to carry out!
- Carry out research into the area of your expedition before visiting it: this may help you to come up with ideas for your goal, and may also help you before, and during, your route planning.
- Decide who you are going to present your project to: choose what format it is going to take before the expedition.
- The most interesting presentations often include personal insights such as: the highs and lows, anxious moments and amusing incidents, what you have learned about yourself and the team.

## ! THINGS TO AVOID !

**FORGETTING TO PACK THE EQUIPMENT YOU WILL NEED TO CARRY OUT YOUR PROJECT:** you may need to take written notes, write a diary, take photos or videos, do sketching or painting, so make sure you pack appropriately.



## DID YOU KNOW?

Assessors will be looking for a project that is well planned. It needs to feel like part of the expedition, rather than something that was added in a hurry at the end!

## THE DOFE WEBSITE HAS SOME VERY GOOD IDEAS



**HISTORY:** research changes in agriculture or study historical buildings.



**ENVIRONMENT:** identify and draw different types of trees, or film the different birds you see.



**TEAMWORK:** make a video diary of your team's experiences, problem solving skills such as with navigation or study different team roles.



**CONSERVATION:** monitor litter levels and consider how to reduce this or investigate the maintenance of footpaths and hedgerows.



**PHYSICAL:** set a group walking speed each day and encourage each other to stick to it, or film warm-up and warm-down sessions before and after your walk to discuss the impact.



**LITERATURE:** write a series of poems about your experiences and critique them, or create a play based on the funniest moments of your expedition and perform it as your presentation.

### USEFUL WEB LINKS:

[Advice from the DofE](#)

# SUCCESS CHECKLIST

## ARE YOU READY?

Hopefully you have read through all of the sections that are relevant to your award level up to this point. The following information is intended to help you in planning for your expedition. The checklist is based on kit requirements and the DofE's Requirements for the expedition section, which you should have read, as they are what your trainer/assessor will use to gauge performance. Please be aware that you may want to add your own items to this list.

YOU CAN TICK OFF EACH POINT ONCE YOU FEEL THAT YOU HAVE FULFILLED THE CRITERIA.

## PAPERWORK

### MAPS

Routes clearly marked out, including checkpoints/ waypoints and campsites. Each day represented by a different colour. There should be a minimum of 2 OS maps per group, ideally waterproof (laminated or in a map case).

### ROUTE CARDS

All sections completed. Ensure brief descriptions of each leg, with grid references. Include realistic timings for rest breaks and team goal project work (project work for Qualifying Expedition only) each day. Identify and avoid hazards in advance if possible. Have one spare copy of route card for the group, and an additional one for supervisor/assessor to retain.

### TEAM GOAL (Qualifier only)

Clearly identified, along with methods of investigation/documentation. Think about how the presentation (if required) will be prepared and delivered after the expedition.

### HAVE CLEARLY IDENTIFIED EMERGENCY PROCEDURES

and knowledge of risk management (e.g. emergency contact numbers).

## FOOD AND DRINK

- Minimum 2 litres of water to be carried per day. Forget CANS of pop and energy drinks etc.

THEY CAN'T BE REUSED OR REFILLED, AND YOU END UP CARRYING AROUND EXTRA RUBBISH!

- Food and snacks for the expedition, divided, labelled and placed into bags for each day.
- Remove any excess or unnecessary packaging. Co-ordinate meals with friends to maximise Trangia efficiency and minimise waiting time
- Plan your menu carefully! What food are you carrying? It should be nutritious, provide lots of energy, not weigh too much or take up lots of space, won't spoil or get ruined, and be something that you are happy to eat and will fill you up!
- Ensure you have some emergency rations (that are for EMERGENCIES, and not when you get a little hungry!) kept in a secured/taped bag. It should not require cooking.



→ Be aware some assessors will check that the emergency rations have survived the expedition ←

# EQUIPMENT CHECKLIST

## PERSONAL EQUIPMENT

- Walking boots (waterproof)
- Walking socks (with optional liner socks)
- 60-70 litre rucksack (with optional cover)
- Waterproof rucksack liner/dry bag + Spare plastic bags for rubbish/additional waterproofing of kit.
- Waterproof jacket (with hood) and waterproof over-trousers; both ideally breathable and the best quality you can borrow/afford. Always ask family and friends!
- 2x Warm layers (jackets or jumpers) (fleece is ideal – avoid heavy cotton jumpers!)
- Base-layers (breathable shirt/t-shirt – football/sports shirts are good)
- Walking trousers – avoid denim and heavy cotton jogging bottoms
- Shorts if appropriate (not denim and ensure they are long enough and not too revealing!)
- Appropriate spare clothing (clean underwear and socks for each day), thermals depending on time of year, kept in waterproof bag. NOT ENTIRE WARDROBE!
- Warm hat and gloves
- Sun hat and sunscreen (depending on time of year)
- Sleeping bag (temperature rating appropriate for time of year) with optional liner.
- Stuff sack with compression straps or similar, to reduce packed volume of sleeping bag. To be carried in 1 waterproof bag/dry bag minimum.
- Sleeping mat – in waterproof bag
- Personal first aid kit with any individual medications. The most common use of first aid kits is for blisters – ensure you have the right stuff to deal with them.
- Torch (with new/spare batteries depending on duration of expedition)
- Emergency whistle
- Watch (not mobile phone alternative!)
- Bowl, cup/mug (plastic/metal), knife/fork/spoon....or Spork...
- Personal hygiene kit/wash-bag (think small, compact and lightweight)

## GROUP EQUIPMENT

- MAP AND COMPASS** minimum 2 maps and 2 compasses per group, plus map cases (for paper maps)
  - TENTS** components broken down and weight evenly distributed amongst group
  - STOVES AND PANS** including sufficient fuel and matches/lighter!
  - CLEANING ITEMS** sponge scourer, wash-up liquid and spare bags for rubbish etc.
  - EMERGENCY SURVIVAL BAG** minimum 2 per group
  - GROUP FIRST AID KIT** There should be sufficient and varied resources to deal with more serious incident e.g. triangular bandage, crepe bandage, ambulance dressing, large non-adherent dressing, gloves, cleansing wipes. These can be divided amongst personal first aid kits if preferred.
  - EMERGENCY MOBILE PHONE** minimum 2 phones per group, using two different networks, turned off and kept in waterproof bag/case
- If wild camping you will need
- TROWEL, TOILET PAPER** (in waterproof bag) **AND NAPPY SACKS** for disposing of all sanitary items.
  - WATER FILTER** and/or water purification tablets - if wild camping you will need a method of purifying water to remove bacteria and particulates (several layers of material – e.g. a buff folded in half can be used to remove particulates).



### OPTIONAL ITEMS

- Appropriate and compact night-wear, gaiters, walking poles, small pack- towel, small pocket-knife or multi-tool (if permitted by school), spare footwear for around camp, small quantity of money for post-expedition ice creams.
- Group shelter, Camera (Mobile Phone is for emergencies only, and does not count as a camera!)



**EXERCISE!** Most people are not used to multiple days of walking, carrying all of their food and equipment with them, potentially over hills and mountainous terrain. Incorporate relevant training e.g. walking with a weighted pack over distance, ideally including ascent and descent.



**NAVIGATION** – master fundamental skills; taking a compass bearing; interpreting contour lines; orientating a map; calculating distance, ascent and descent. Map reading and navigational skills will only improve with practise!



**KIT SELECTION** – don't leave it until the night before an expedition to obtain your equipment and clothing. Plan in advance and ensure that you have everything you need, and that items such as tents, boots and waterproofs have been tried and tested!



**PACKING** is definitely a skill. Prior to any expedition you should have practised packing your kit. This includes everything that you would be carrying – group kit personal kit, food and water etc. The total weight of everything you carry should not exceed 1/4 of your body weight so check how heavy your bag is! Pack weight (including 2 litres water) should ideally be less than 15kg.



**WATERPROOF YOUR BELONGINGS!** Remember that wet things are heavier than dry things, therefore if you keep everything waterproof and dry, you avoid carrying extra weight! Purpose made dry-bags are excellent, but are also expensive. A good alternative are HEAVY-DUTY building/garden waste type sacks. Cheap bin-bags split and tear easily and are useless. Whatever method you choose, make sure that the top of the waterproof bags are rolled up to protect the contents.



There is no use having **EMERGENCY PROCEDURES** if you can't implement them when required!

Knowing what to do and who to call is essential. If you are on a qualifying expedition, then you will be expected to have a reasonable knowledge of emergency procedures and understanding of how you can manage and minimise risk. If you are unsure, or have any questions, then find out beforehand!



When **PLANNING YOUR MENU** ensure that you have tried and tested the food that you are going to eat, rather than hoping that a pre-packed meal will taste nice! Being aware of how much food you eat, and measuring out sensible portions of rice and pasta (rather than carrying 1kg bags around with you) also eliminates extra weight and saves space. Just be aware that being active all day will build up a good appetite, and you might want a little extra than normal.



# SUCCESS CHECKLIST - ESSENTIAL SKILLS & PREPARATION



**CHECK THE WEATHER** conditions and forecast for your expedition area. Understanding what the weather conditions may be like can influence some of the equipment/clothing that you take, but can also help you to prepare psychologically for what is ahead.



**BE FAMILIAR WITH THE HIGHWAY CODE** – this gives you good information on safely managing roads you may encounter (which are often regarded as one of the most dangerous aspects of an expedition).



**BE FAMILIAR WITH THE COUNTRYSIDE CODE** – awareness and respect for the areas in which you are undertaking your expedition is essential! Management of gates, rubbish, noise etc are all things that you will have to think about.



Do you think you are **MENTALLY PREPARED** for the expedition, and fully comprehend how your emotions and mental state may change over the course of the trip? You may find yourself more physically tired than you have ever been before, which in turn will affect your mental state. You may become more emotional, irritable and short-tempered, angry, despondent, and lose enthusiasm and motivation. If so how will this affect the other members in your team? Knowing how your emotions can change, and the consequences, can help you to better recognise and manage them in future.



**WORKING TOGETHER** as part of a team is essential to successfully completing an expedition. Remember this during all aspects of the planning and practical elements. Maintaining good relationships, whereby team members will support and encourage each other through the hard times, can often mean the difference between success or not.



**UNDERSTAND THE AMOUNT OF EFFORT** that is required to get you through your chosen expedition, as Supervisors and Assessors will be looking for best efforts in all areas. The difference between the three DofE levels is the amount of commitment required. All three levels are challenging, and should not be underestimated. Additionally you should not think that simply turning up ensures success on your qualifying expedition.

You have to meet certain conditions and criteria, otherwise you will be deferred. However if you do successfully complete your qualifying expedition, be safe in the knowledge that you have truly earned it!

**LASTLY.....** Please ensure that if there have been any changes to your medical/health status since submitting your medical form, you update School/Learn Outdoors ASAP.

## GOOD LUCK!

### USEFUL WEB LINKS:

[Expedition Requirements, from the DofE](#)

[The Countryside Code](#)

[The Highway Code](#)

# DofE: SILVER & GOLD NAVIGATION

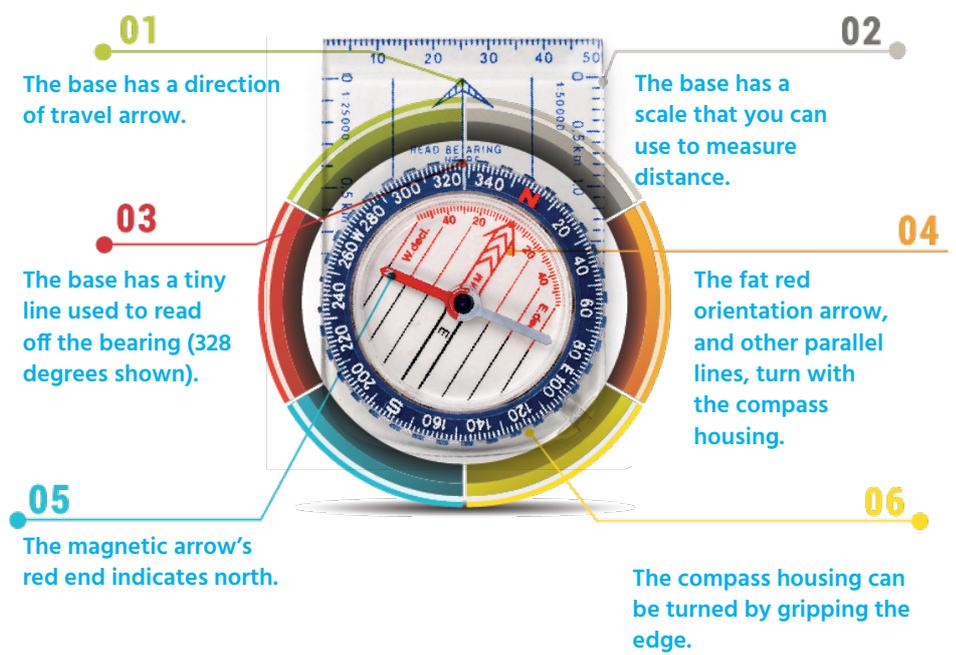
At Silver and Gold your assessor will expect you to have a good standard of navigation, and to be able to efficiently move across the ground according to your route card plan.

Here are some notes and reminders to help you achieve that:

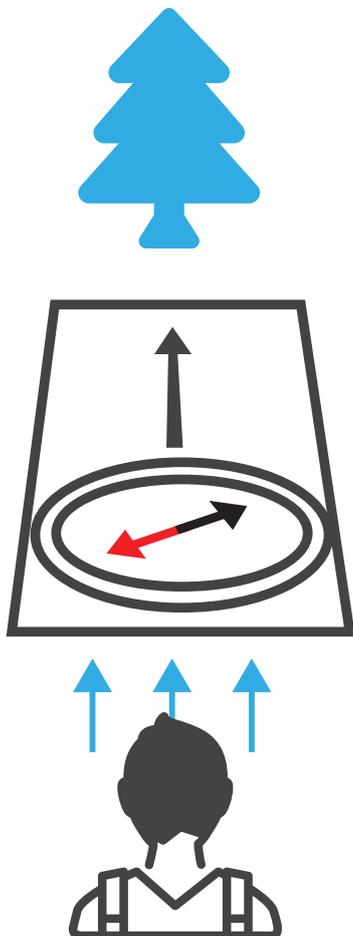
- ✓ **USE 1:25,00 SCALE FOR NAVIGATION** Large blue grid line squares are 1km along each side. Use the scale on your compass to measure distances.
- ✓ **SPEED OVER THE GROUND** On average, this will be about 3km per hour (2 minutes per 100m), but can vary. On very difficult/boggy flat ground this may reduce to around 2km per hour or less.
- ✓ **STEEP GROUND UPHILL ALSO HAS A BIG IMPACT ON SPEED** On your route card calculations, add a minute for every 10m contour line crossed. This will reduce your speed to around 2km per hour on steep up-hills. A prolonged period of steep downhill might slow you down when you are on the hill (but don't put this on route cards).
- ✓ **MAKE USE OF CONTOURS** Other land features are more likely to change (e.g. boundaries)! Contours are VERY useful, especially in wild country.
- ✓ **MAKE USE OF TEAMWORK** The navigator(s) should make use of other members of the team to do pacing (tally sets of 100m to make it easier) as well as timings.
- ✓ **OVER-SHOOT/CATCHING FEATURES** It is useful to have a good idea of features you can look for which tell you that you have gone too far along a leg.
- ✓ **TICK FEATURES** Features to tick off in your head as you complete a leg. If a tick feature does not turn up when it should, stop and think about what has happened.
- ✓ **PACING** You should know (and use) how many paces (double steps) make up 100m. Normally, over rough or steep ground, you might add about 10-20 double steps to your normal pacing. When pacing bigger distances, it is essential to only count to 100m and tally that as a '1' (use small pebbles, or each person do 100), then start counting from zero again. At Gold, your assessor will expect you to be using pacings regularly where the conditions necessitate it.
- ✓ **IF YOU FAIL TO PLAN, YOU PLAN TO FAIL!** Divide each leg of your route card into shorter mini-legs, and on each mini-leg one or more members of your team should decide which aspects, such as distance, bearing, timings, pacing, tick features and over-shoot features may be necessary to complete that mini-leg successfully. Remember, you could delegate different tasks to different team members.
- ✓ **SETTING THE MAP** This is a basic Bronze/Silver skill. Put the compass flat on the map and simply turn your whole body until the magnetic red arrow is pointing to North on the map. Looking around you, your surroundings should now 'line up' with the map in your hand – this helps you to recognise features around you.

# EXTRA INFO

✓ **COMPASS BEARINGS** To set the compass to a bearing using the map, put the side of the compass along your route with the direction of travel arrow (#1) pointing the way you want to go. Twist the compass housing (#6) until the fat red (orientation) arrow (#4) inside points to Grid North on the map – it helps to line up the parallel lines with the blue grid lines on the map. Take the compass off the map, account for Grid Magnetic Angle\*, and it is ready to use as below. Don't forget that compass bearings are not so useful if you are not standing in the correct spot when you start!



Compasses should always be held flat in your palm and perpendicular in front of you, then move your body until the red magnetic arrow (#5) nestles inside the fat red (orientation) arrow (#4).



Once a bearing has been set look along the direction of travel arrow (#1) and pick out an obvious feature in the distance (the farther away, the better, but do make sure it will not drop out of sight as you walk!). You can then put your compass down and concentrate on walking safely to this feature. You now don't need to walk in a straight line.

Once at this feature you can then pick out another one along the direction of travel arrow, walk to it and repeat the process until you reach your ultimate objective.

## ! Grid Magnetic Angle !

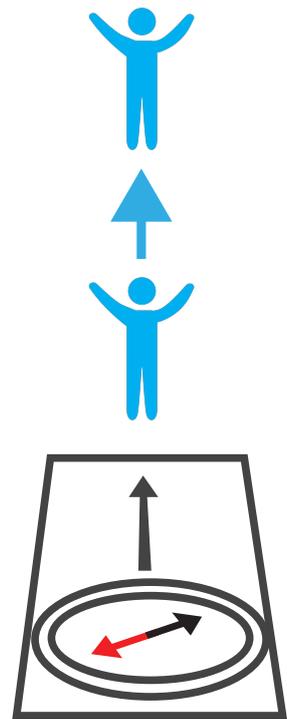
You can find the angle between Magnetic North and Grid North in the key on your map.

Alternatively, visit the following website and type in your grid reference or area postcode:

[www.geomag.bgs.ac.uk](http://www.geomag.bgs.ac.uk)

✔ **LEAPFROGGING** In poor visibility you can use one or more of your team walking a little ahead of you as the feature to sight on, shouting directions (left, right etc) until they are situated along the bearing.

➔ WALK TO WHERE THEY ARE AND REPEAT ➔



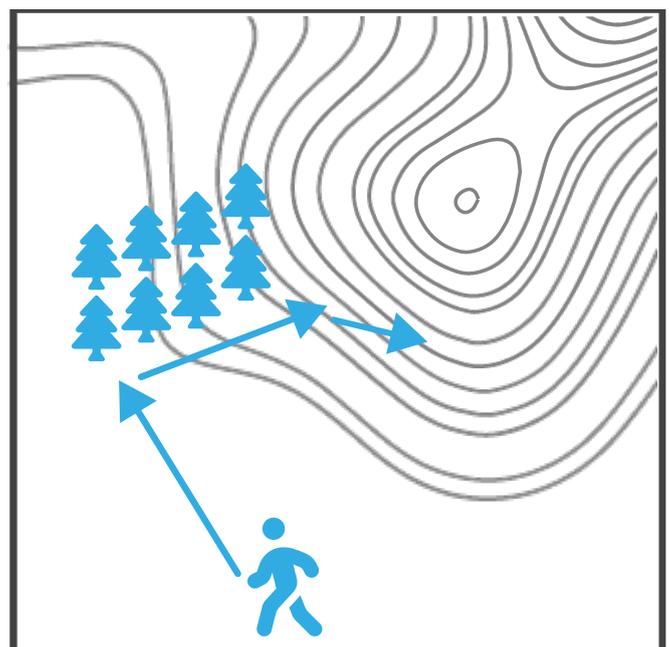
✔ **BACK BEARINGS** "Have we been walking in the right direction on our compass bearing, or have we drifted off course?" Turn around and aim your compass at the point you have just walked from. If the South magnetic arrow is lined up with the orientation arrow below you are OK and have been walking along your planned bearing. Congratulations! If it doesn't line up walk to your left or right until you are back on your bearing.

NB: You will need to take into account the **GRID MAGNETIC ANGLE**. This will be the opposite to taking a normal bearing **E.G. ADDING INSTEAD OF SUBTRACTING**.

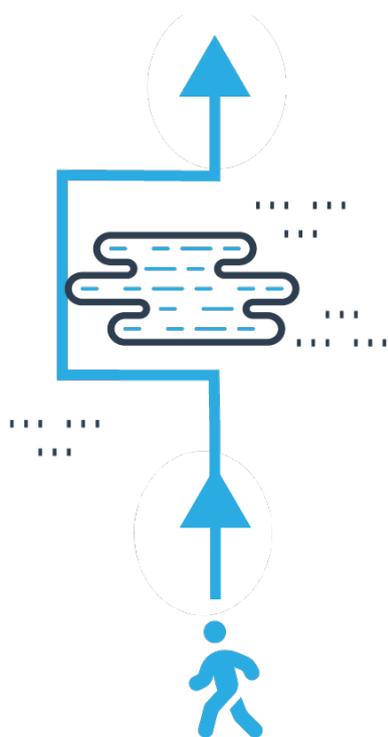
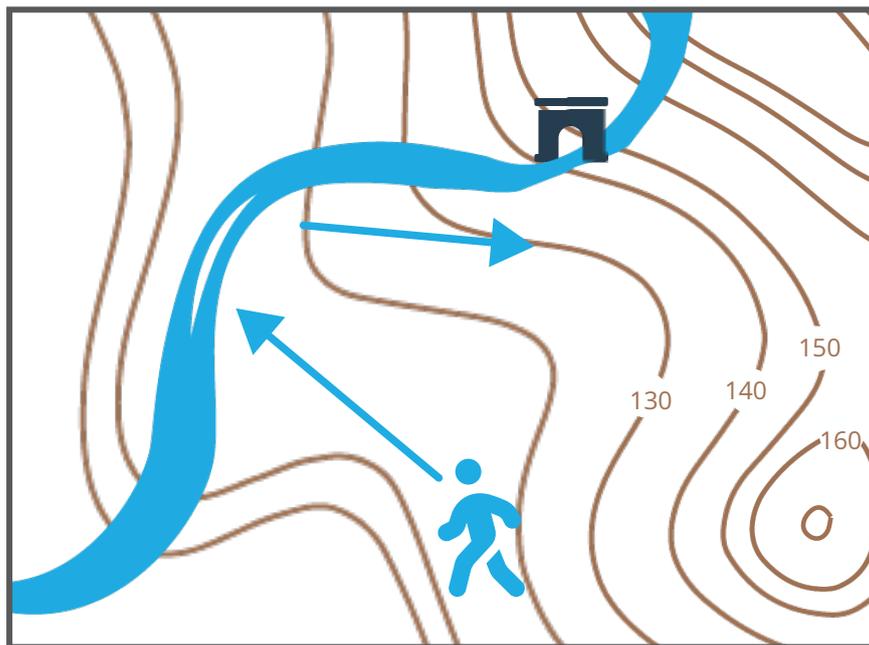
✔ **HANDRAILS** Any linear feature e.g. a boundary, stream or edge of a wood makes a useful feature to navigate along – think about incorporating these when planning routes.

✔ **ATTACK POINTS** When trying to navigate to a point in featureless terrain, it may be wise to navigate to an easier, or larger, feature nearby.

Once you are located at the attack point, you can then more easily complete the final stretch to the point you need to reach.



✓ **AIMING-OFF** A technique used when trying to navigate to a feature that could be missed if walking along a bearing is not sufficiently accurate. You should therefore set your compass to deliberately take you to one side of it to where there is a catching feature which you can hand-rail along to your destination e.g. following a river upstream to a bridge.



✓ **BOXING** Used when trying to make a small detour, e.g. around a bog, without losing the bearing line you were walking on, and without having to make any adjustments to your compass. The basic idea is to pace out 3 sides of square or rectangle. Turn at 90 degrees to the bearing you were walking on by turning your body until the magnetic needle points to East or West on the compass housing (depending on whether you want to turn left or right).

Pace out a particular distance that allows you to bypass the obstacle, then turn back to your original bearing and move forward until the obstacle is passed. Then turn back (to West or East) and pace out the same distance as the first leg to complete the journey back to your original line, where you can finally turn and use your compass to continue. Only the side that was parallel to your original line should be added on to keep a tab of your total distance travelled.

# EXTRA INFO



**RELOCATION** Here are some ideas to help you relocate yourselves when you are LOST on rather open, featureless ground.



**SET THE MAP** (see above) and try to recognise features around you.



**WALK UP** onto nearby higher ground to try and get a better view.



**SEND TEAM MEMBERS** off in different directions (a short distance, remaining in sight of each other) to look for features you can identify on your map. All team members should return to the start point. Don't split the team in poor visibility!



If feasible/quick, walk back to a last-known point and try again **OR THINK ABOUT FEATURES** you just passed.



**BACK BEARINGS** and re-section. If you can see a known feature in the distance, you can take a back-bearing from it and transfer this line onto the map – your location is somewhere along this line. If you are able to take back bearings off multiple features and also draw these lines on the map you are likely to be located near the intersection of the lines – this is called a resection.



Overall, narrowing down the options as to where you might be, by a **PROCESS OF ELIMINATION**, is a good strategy.



**MACRO-NAVIGATION:** Never forget about the big picture, particularly when you have good visibility. Keep your head up, look around and make sure the major features are where you'd expect them to be – hills, rivers, valleys, lakes, forests, roads etc.



All of the above navigation skills can be practised, with a little ingenuity (with a map of your local area, perhaps) before your practice expedition, but especially before your qualifying expedition.

**WE THOROUGHLY RECOMMEND THAT YOU DO SO.**



You can find multiple useful resources, refreshers and further reading, available on the Ordnance Survey website:

[Ordnance Survey Map Reading video tutorials](#)

➔ **GOOD LUCK!** ←

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