

COLD

- Clean, Overheating, Loose/Layers, Dry
- Priority on head and extremities
- Dead grass under jacket and pants
- Blizzard/snowstorm – seek shelter, do not travel
- Avalanche – drop gear, swim diagonally towards the closest edge
- Freezing water – swim to the side you fell, do not pull yourself out, get horizontal and swim-drag yourself out of the hole. Once out, do not stand up, roll away from the hole. Once in safe ground, replace wet clothes with dry, wrap in mylar and tarp, start a fire
- Hypothermia – dress for C.O.L.D., avoid long sub-zero temperatures, seek shelter, start fire. Confusion, Shivering, Difficulty speaking, Sleepiness, Stiff muscles. Treatment – seek shelter, cover head and extremities, lie down, use warm bottles to the neck, armpits and groin and drink warm drinks. Do not start a fire, do not drink alcohol, do not rub, do not submerge in hot bath
- Frostbite – cover face and extremities, keep dry, well fed/hydrated, loose footwear and clothing, avoid long sub-zero temperatures, avoid moisture, sweat and drinking alcohol. Stage 1 (Frostnip): cold, sore, red and painful skin, Stage 2: Feeling of pins and needles and patches of peeling skin, Stage 3: Numbness and hard, black skin. Treatment – do not rub, do not put over fire, drink warm fluids, put hands in companion's armpits or groin, wear gloves

SHELTER1

- Close to building material, fire fuel, water source, foraging source
- Natural windbreak (big rock, tree grove)
- Not in the sleeping area of dangerous animals (wolf, bear). Look for tracks, scat, etc
- Insect free (swamp, marsh, lake, insect attracting bushes)
- Not in path of flood, avalanche, land slide, tree/rock fall

SHELTER2



Cave



lean-to



debris hut



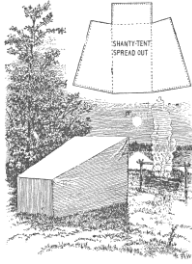
dirt trench



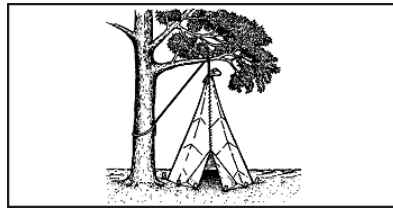
scout pit



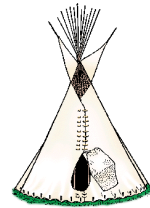
wigwam



brush shanty



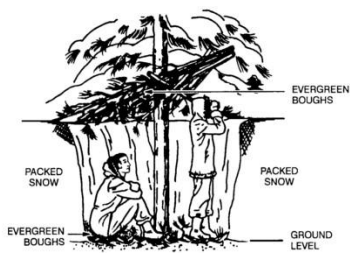
Tepee (no-pole, one-pole, multiple poles)



surplus tent



camping/hiking tent



tree pit



snow trench



igloo

- Fire bed. Campfire stones buried in the sleeping ground
- Branch bed. See lean-to photo
- Swamp bed. Raised branch bed



hunter's chair



tarp chair

- Tarp hammock
- Hammock chair Same as with the hammock, only one side of the tarp is tied significantly lower on the tree
- Open shelter to avoid moisture, damp, CO2. Tent in cold wind, alpine altitude, arctic cold

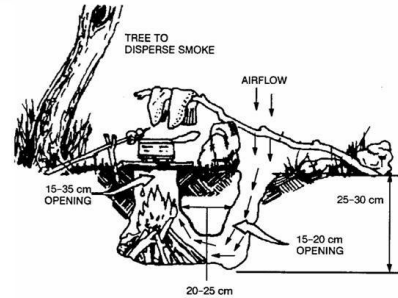
FIRE1



feather stick



tepee



Dakota fire pit/hole



pyramid



Siberian log fire



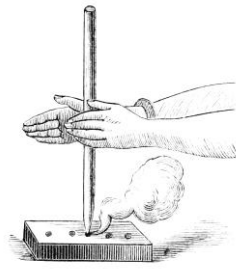
Swedish torch

- Wet pyramid. First layer (snow, wet ground) with green logs
- Fire reflector. See lean-to photo

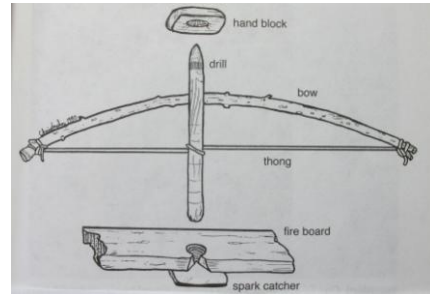
FIRE2



fire plow



hand drill

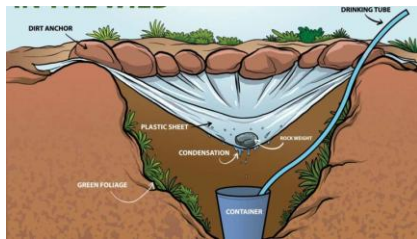


bow drill

- Flint and steel. Flint/chert/quartz/obsidian/jasper/marble, high-pitch when tapped, smooth and glassy, red ones. Strike or scrape
- Ferro rod, Magnesium rod
- Tinder bundle, tinder fungus, birch bark (scraped in-side), punk wood, feather stick and char cloth

WATER

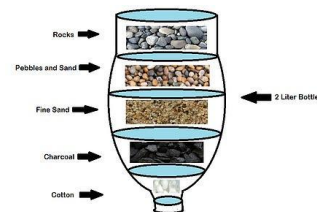
- Hovering mist, brighter area, lush vegetation, birds, gullies
- Morning dew with clean cloth



solar still



transpiration bag



water filter

- Edible sap (maple, vine)
- Dig hole
- Boil for bacteria

FORAGE

- Plants in abundance
- Step 1: Discard if strong, unpleasant odor. Step 2: Inner elbow or wrist for 8 hours. If skin burns, itches, feels numb, or rash, wash off and do not eat. Step 3: Lips for burning or itching. If no reaction hold for 15 minutes. Step 4: Small bite, chew, hold it in mouth for 15 minutes. If very bitter or soapy, spit and wash mouth. Step 5: If no reaction, swallow and wait for 8 hours. If no ill effect plant is edible. Repeat test for other parts of plant
- Flowers, berries, fruit, nuts, pine needles and cones, tree leaves and cambium, roots, cereals, grains, herbs, tinder fungus, acorns, honey, bird eggs

- Acorn leaching. Method 1. Unpeeled acorns in sack in river for a few days. Method 2. Peel or coarse grind and submerge in pot of water for a few days. Change water daily. Method 3. Peel or coarse grind and simmer for 30 minutes. Drain and put in another pot with pre-boiled water (not cold water). Repeat until they're not bitter. Cold leaching for flour, hot leaching (sweeter) for roasted snacks, coffee, etc. Faster leaching: scrape off a little of the dark skin layer as well

FISHING



leister



harpoon

- Bow fishing. Aim a little lower due to light refraction



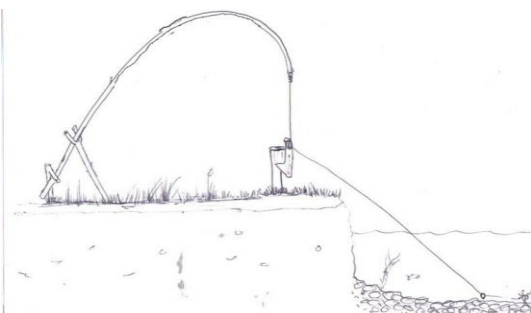
shore trap



weirs



basket trap



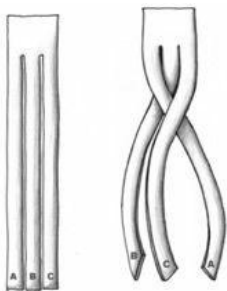
fish snare

- Rods. Hooks: thorn, bone, antler, wood, wire. Line: bark strip, cordage. Bait: worm, cricket, frog

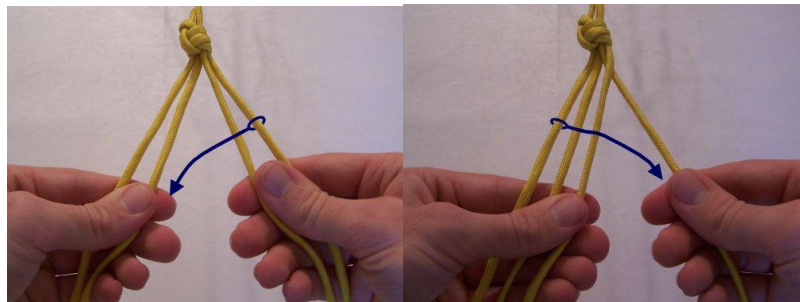
CORDAGE

- Nettle, thistle, bramble, wild oat, white clover, willow, oak, elm, juniper, aspen, maple, hazel, birch, poplar, ash, lime

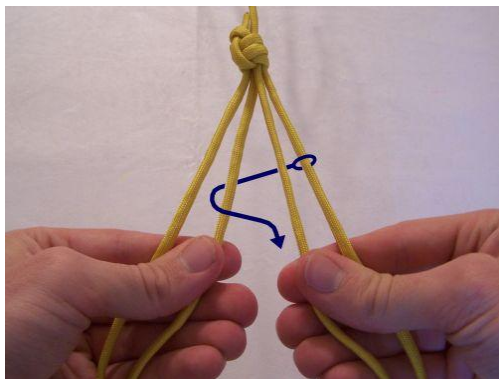
- Grasses: end of growing season. Let stems dry. Pound them. Split them open. Peel the outer wood to leave the fiber. Rub the fibers in your hands to completely clean and separate them. Trees: spring or summer. Phloem strips (just before the cambium). Strip the outer bark from the fiber. Soak in hot water or even boil. Hang to dry. Rub to separate. If dried completely, soak and then work them
- Keep them a little moist while twisting, not completely dry. Add new fibers well before you run out. The points where you add new fibers should be uneven for the two plies, not at the same height. Keep each ply the same thickness



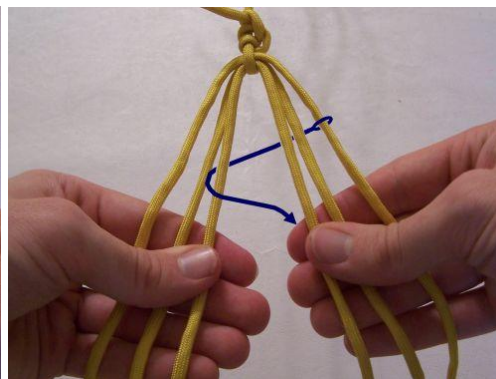
3-strand flat braid



4-strand flat braid

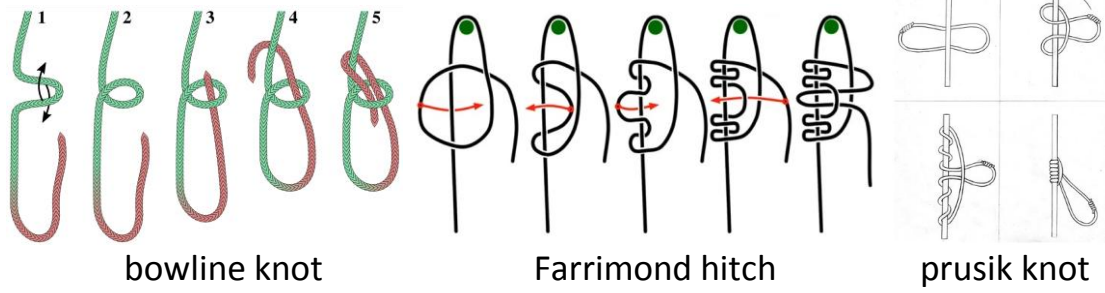


4-strand round braid

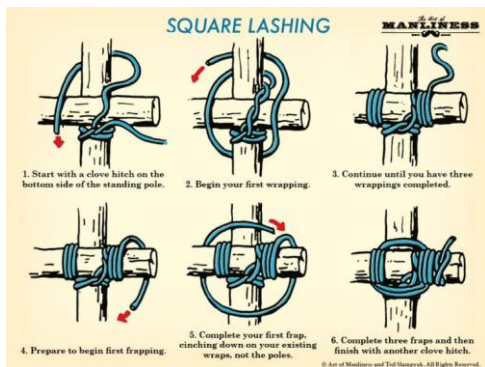
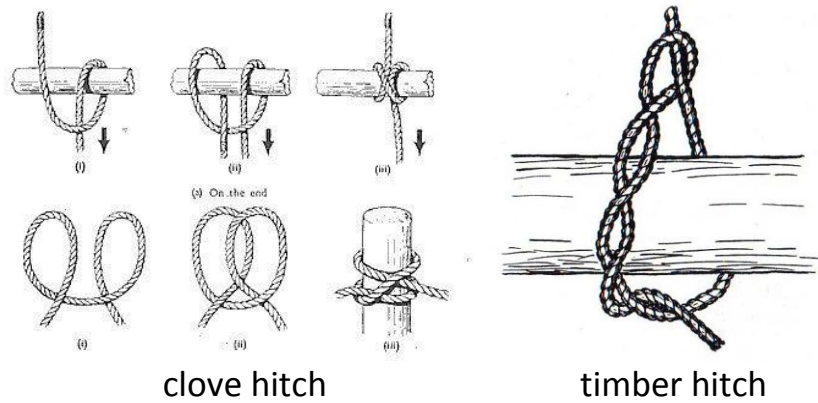


6-strand round braid

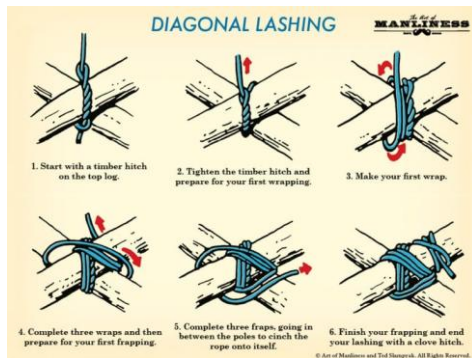
- Splices
 - 3-braid back splice: take, say, braid 3 and, going counter-clockwise, place it over the previous one, braid 2. Take braid 2 and place it over braid 1. Take braid 1 and pass it through the loop of braid 3. Then tighten up the knot you created. Now start the back splice. Pick any of the 3 loose strands, find the nearest twisted rope strand next to it, untwist the rope a little and go over it and under the next. Repeat the back splice starting again from any of the 3 strands



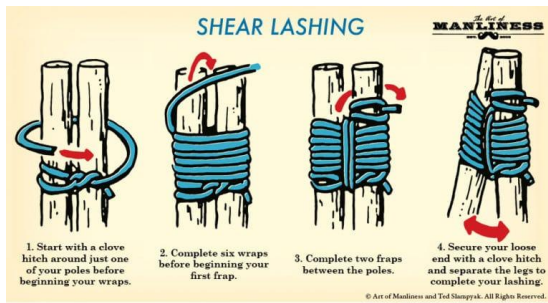
Evenk knot aka Siberian hitch



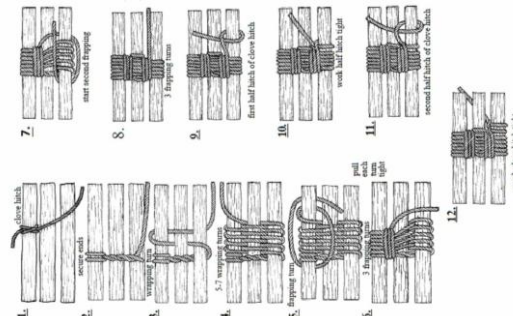
square lashing



diagonal lashing



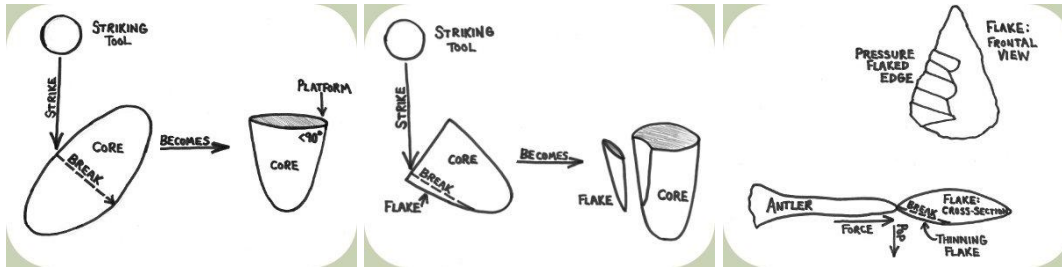
shear lashing



tripod lashing

KNAPPING

- Stones same for flint and steel



- Changing angle will produce different shape and size flakes
- Antler, bone, hard and fire-hardened hardwood, metal, etc. Abraid the edges with another stone. Repeat every now and then. Sit on a chair, cover your thigh with a piece of hide or thick cloth, hold your flake in a horizontal position with a piece of hide or leather to protect your hand, press both hands against your covered thigh for better control, place your tool's tip where you need a small flake to be removed and press down

TRACKING

- signs
 - Habitat, landscape (cover, food, water, transition areas), routes (trail, run, escape), sleeping area (bed, lay, den, burrow, etc), feeding area
 - Rub, hair/feathers, gnaws/chews, scratches, debris/disturbance, scat:
 - Tubular = canine/bear/skunk
 - Tubular+tapered ends = fox
 - Tear drop or tapered end = feline
 - Oblong = deer/goat/sheep/boar/hog
 - M&Ms = rabbit/hare

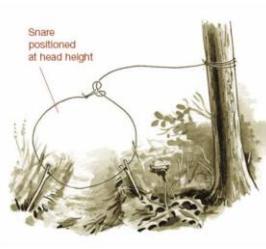
- Fattened threads = weasel
 - Pencil lead = rodents
 - Hair = carnivore/omnivore, seeds = herbivore/omnivore
 - Aging
 - Compression/sideheading
 - Morning dulling, daytime shinning and depression
- tracks
 - True track, feline:round track, canine/fox:oblong track, feline:no claw marks, canine/fox:claw marks, dog:larger inner toes, jackal:larger outer toes, wolf/fox:equal size toes, fox:heel pad ridge, deer:outside larger toe
 - Size (length, width), stride (front to back toe), straddle (gap between left-right track lines), pitch (angled beaver)
 - Only felines and fox are direct registers
 - Diagonal (canines, felines, fox, deer, boar), galloper (rabbit/hare, squirrel, rodent), bound (marten, weasel, mink, otter), pacer (bear, beaver, badger, skunk, porcupine))
 - Diagonal walkers only: males wider front tracks, females wider rear
 - If one front foot is behind the other front over 4-5 tracks, it will tend to circle in that direction
 - aging

TRAPS

- Baiting depends on target animal



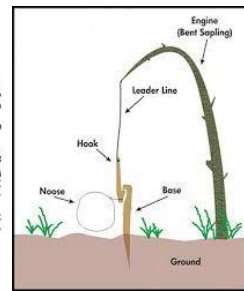
figure 4 deadfall



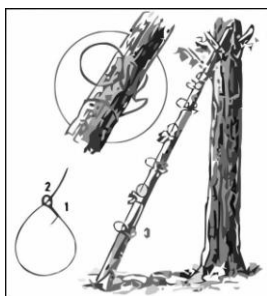
snare



drag snare



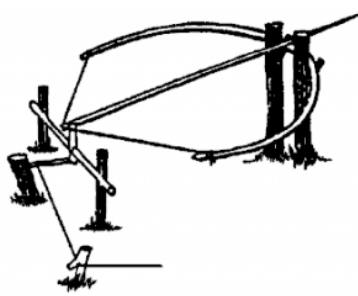
twitch up snare



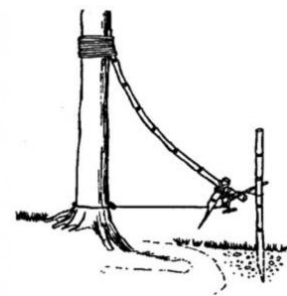
squirrel pole



bird pole



bow trap



pig spear trap

BOW HUNTING

- Wash clothes and shower with natural no-scent soap, slightly smoke clothes, no deodorants/aftershave/toothpaste/gum/garlic/onion/sauces, do not dress to sweat, charcoal/ash on clothes (not skin), non-toxic plants or pine needles on clothes and skin, bottle with strong local tea
- Non-geometrical, non bright clothing (Realtree, Mossy Oak, BDU, ACU, OCP, ABU, DCU, etc), break silhouette, brush/fabric strips ghillie, soot
- No fabric/boot squeaking, no zippers ringing, downwind, stealth moving:
 - Fox. 1. Lower the foot to land on the outside of the ball with light pressure. 2. Roll off the edge of the foot onto the ball laying the whole foot down still with only partial weight. 3 Place full weight on foot
 - Weasel. 1. The body is over the thighs, knees bent. 2. Lower the foot to land on the outside of the ball with light pressure. 3. Roll of the edge of the foot onto the ball keeping the heel off the ground. 4. Place full weight on the ball. The heel can land but only for temporary balance
 - Stalk. 1 min per step
- Spot and stalk hunting, ambush hunting (bait, ground ambush, bush cover, blind, treestand)
- Right above and just behind front leg (shoulder), broadside or quartering away
- Blood trailing
 - Light/bright red or pink and frothy = heart/artery or lungs : wait 30+mins
 - Dark red = liver/vein/muscle : wait 3+hrs
 - Brown/green/yellow and stenchy = paunch (stomach/guts) : wait 6+hrs
 - Ham, leg, shoulder, neck, spine : second arrow, immediate pursuit
 - Determine side of bleeding to detect potential backtrailing
 - Splatter shows fleeing speed

BOWS

- Bundle bow, self bow (sapling, English LB, Danish FB, Native Am. FB, Am. LB/Am. FB), cordage backed
- Bow length. 1,5 - 1,8m

- Draw length. Middle fingers tip to tip by 2,5
- Tilling. Split-finger, 3-under, center grip, silencers
- Draw weight. E.g.: 25-30kg for medium size/strength man. 40kg+ for large/strong
- Oak, yew, juniper, ash, elm, mulberry, black locust, maple, cedar
- Olive:2700, pistachio:1930, apple:1730, black locust:1700, mulberry:1680, pear:1660, european yew:1520, european ash:1480, maple/european beech:1450, ailanthus:1420, english walnut:1220, sweet cherry:1150, english/sessile oak:1120, sycamore maple:1050, wynch elm:990, english elm:810, european lime:700, sweet chestnut:680, black pine:660, white willow:570, italian cypress:560, black poplar:460, white poplar:410, spruce/european aspen:380, silver fir:320
- Late fall/winter: shorter/safer, spring/summer: easier debarking. Straight shape/grain, no bends/lumps/wounds/knots/rips/twists, longer to compromise for ends checking, 10+cm diameter. Staves at harvest day, debark same day, seal ends immediately with glue, paint, varnish, pine pitch or wax
- Staves in cool and dry for at least 1yr. To speed up, rough-shape the bow and place in salt

STRING

- Natural cordage, paracord 550, Dacron B50 (standard industrial bow string)
- Sinew. Twisting and plying the same way as making cordage
- Animal gut. Trim off fat chunky side and excess fat. Take one end of 3-4 plies and tie together in a stick or ring. The same for the other end. Hang one ring high on a wall and twist the other ring. When gut twisted in solid uniform appearance as much as it can go without tearing apart, secure bottom ring so as the gut is in a little tension and let dry for a week or so
- Twisted gut, sinew, cordage, paracord 550, Dacron B50

ARROWS

- Length. Nock throat (not nock ears) to front of shaft without the point. Measure distance from nock throat to front of bow at full draw. It should roughly equal draw length. Add 4-5cm of shaft for broadhead arrows
- Weight
 - GPI. Shaft only. Light (127-153mg/cm), midweight (178-229mg/cm), heavy (255+mg/cm)

- GPP. Total weight divided by draw weight. Light (0,714-0,928gr/kg), midweight (0,928-1,14gr/kg), heavy (1,14+gr/kg), wooden (at least 10 GPP or 1,42gr/kg). To find proper arrow weight, multiply draw weight (e.g. 25kg) by targeted GPP (e.g. 1,42gr/kg for wooden). $25\text{kg} \times 1,42\text{gr} = 35,5\text{gr}$ or 550 grains
- Wood arrows: light 350-400 grains, medium 420-500 grains, heavy 600+ grains (or 0.05-0.57 lbs, 0.06-0.072 lbs and more than 0.085 lbs) or (22,5-26 gr, 27-32,5 gr, 38,8+ gr)
- Lighter (contest) = faster, straighter flight, longer distance, louder, wind-weak. Too light = dangerous. Heavier (hunting) = penetration, quiet
- FOC. Difference between shaft midpoint and arrow balance point. FOC determines accuracy. Ideal FOC 7-15%. Measure from nock throat to shaft end and divide by 2. Find the arrow balance point and mark it. Measure from there to nock throat. Subtract the center of arrow measurement from the balance point measurement. Multiply by 100. Divide by shaft length. E.g. 5-10cm FOC for 70cm shaft $[(BP-(L/2)) \times 100] / L$
- Spine. Stiffness. Accuracy. Low stiffness shoots right, high stiffness shoots left. Static spine: deflection of arrow in inches under 880 gr (1,94lbs). Static spine 250 = .25 inches = 6,35mm deflection, static 700 = .7 inches = 1,778cm. Increase/decrease dynamic spine by changing arrow length, draw weight, adding/removing weight from the ends of the arrow. E.g., adding weight to the front weakens its spine
- Keep left-right feathers separate. Split quill. Cut to the desired size/shape, leave a little bare quill on both sides. Sand the quill down
- Fletching. Feathers on arrow all left or all right wings. 3-4cm from nock. Three 10-12cm feathers helical (3 degrees) or offset (1,5-2,5 degrees). Carve shallow indentation to help positioning and gluing the quill. Glue with hide glue, not pine pitch. There are two ways to measure the degree:
 - Looking down on the shaft from the nock. Radius of the shaft diameter. For a 9mm diameter arrow shaft, 3 degrees mean $(2\pi r/360) \times 3 \Rightarrow (2 \times 3,14 \times 4,5/360) \times 3 = 0,2355\text{mm}$ distance. For 1,5 to 2,5 degrees the distance is 0,11775mm to 0,19625mm
 - Looking at a standing shaft from the side. Radius of the imaginary circle the vane creates. For a 10cm vane (feather not quill), 3 degrees mean $(2\pi r/360) \times 3 \Rightarrow (2 \times 3,14 \times 5/360) \times 3 =$

0,26mm distance. For 1,5 to 2,5 degrees the distance is 0,13mm to 0,21mm

- Secure broadhead with cordage and pine pitch
- Pine, spruce, cedar, poplar, ash, maple, etc. Hardwoods make heavier arrows
- Heat-straightening right after harvest, at green state. Drill hole or carve groove in a hardwood/antler/stone to use as straightening wrench
- Seal both ends as with bow and tie with bark on into a bundle for 6 months

COOKING

- Adjustable suspender, earth oven, carved fork/spoon, bow-drilled spoon

ORIENTATION

- Left foot towards first shadow mark, right foot towards second. You are facing North
- Stick a straight pole on level ground. Mark first shadow in the morning, smallest at noon and last before night. You may tell summer solstice, time of year, season, even month
- Big Dipper = handle downwards, Small Dipper handle upwards. Extend front end of Big Dipper to meet Little Dipper handle = Polaris
- Moss tends to grow more on the North side of trees in the Northern Hemisphere
- Pine tips will bend towards the South in search of more sunlight
- practical GPS
 - hemisphere. Big or Little Dipper = northern hemisphere. Southern Cross = southern hemisphere. If compass needle tilts towards ground = northern hemisphere. If tilts towards sky = southern hemisphere
 - latitude. Equator = jungles, rain forests. Moving away = broadleaf and coniferous forests, further north = spruce, birch, larch, tundras, elk, bison, reindeer
 - longitude/continent. Alligators = Americas, China. Alpaca/llama = South America. Roe deer/pine marten = Europe. Lion/zebra = Africa. Sun bear/clouded leopard = Asia. Kangaroo/koala = Australia. And so on
 - Low altitude: carob trees, citrus trees, pomegranate trees, almond trees, olive trees, walnut trees, pear trees, foxes, jackals, hares. Middle: apple trees, cherry trees, boars, wolves,

deer. High: chestnut trees, fir trees, wild goats, rock partridge, bear, etc. Alpine altitude indicators are the absence of trees

TRAVEL

- Waterskin, horse shoe pack, tarp pack (1 piece cordage, Farrimond hitch), Roycroft/Evenk frame (Diagonal lashing), rucksack straps (bark, braided bramble)
- Tarp raft. Tarps or ponchos filled with dead grass secured under a sapling frame
- Log raft. 1. series of loose logs with 4 perpendicular saplings to secure them, two on each end, one over one under 2. Lay two parallel base logs for the sides and lay the raft logs on them. Start with a timber hitch on one side of one of the base logs. Move the rope over the first perpendicular raft log towards the side the log continues, not the ending side. Then go down and under the base log to come out the other side. Now you should be on the ending side of the raft log. Make a bight with the rope and pass it through the raft log. Repeat until you lash all the raft logs and end with a clove hitch on the other side of the base log. Do the same for the other base log. You can add one or more base logs in the middle depending on raft size, secured by square lashing. In both designs you can add a second perpendicular layer of thinner saplings for more comfort
- Snowshoes. 1 Evergreen branch. 2 Parallel saplings lashed into points, off center perpendicular boot sticks. 3 Racket saplings
- snow goggles. Wood or bark strip with slit. Holes, dovetails, notches, soot
- Leeward = drier, warmer. Windward = wetter, colder, wind, rain, snow
- Cloud reading
 - Isolated, wispy, or very high = fair
 - Crowded, dense, dark, and towering = changing or worsening
 - The sharper the edge of a thundercloud and the darker its color, the more violence it may contain. Don't go below or near it
 - If cloud color, shape, and size change, so will the weather
 - As puffy cumulus clouds darken, enlarge, and become dark cumulonimbus clouds, expect squalls within two hours

MISC

- Scarf key
- Ice glue

HYGENE

- Soap. White hardwood campfire ash and water, water and sand, evergreens tea, moss
- Tiolet paper. Dead grass, non-toxic broad leaves, pine tea, moss
- Tooth brush. Soft twig with crushed end
- Bandage. Non-toxic broad leaves and bark strips (e.g. plantago)
- Wolf/bear encounter. Arm guard
- Insect repellent: chrysanthus, wild garlic, wild onion, pennyroyal

GLUES

- Pine pitch. Pine resin, pinch of binder (ground herbivore dung (e.g. hare) or sawdust, or bone dust, or hardwood ash or animal hair or dried and ground stem hearts (e.g. thistle, bramble, etc) or anything similar), for elasticity (fat, tallow, lard, butter or beeswax), charcoal makes it harder and less sticky (1:4 to 1:1)
- Hide glue. Rawhide, hooves, sinew, bones. Soak overnight. Simmer for a few hours (just before boil). Ready if gelatinous when cool. Cut in small chunks, back to simmer, skim pieces. Cool, slice into thin slices and dry in a cool place. Fan drying is best. Grind it to powder
- Bark canoe. Minimal frame, single bark sheet or shingled bark sheets, pine pitch

TANNING

- Non-iodized, prickling salt only and always. Never rock salt
- Tanning fur. Move to cool shade, skin, scrape excess meat/fat, rub salt (kilo for a kilo). Optionally, 1 cup boric acid to 50kg salt. Spray flea/tick/bug killer, roll and carry home hanging, not in bag. At home, submerge in non-metallic bucket of 10lt water, 2-3kg salt, 150ml Dettol. Optionally, citric acid. pH 1,5-2. Room temperature. Stir each day for couple of days. Rinse well and flesh from head to toe. Back to bath for couple of days. Then take out again, rinse well, flesh again and submerge for another couple of days. Rinse well and submerge in water-baking soda-pickling salt bath for an hour and stir every 10 minutes. Wring good and hang to dry, not completely but remain damp. Brain tan (see below), smoke and oil
- Store. Lay hide open, change the salt, and change the salt again after a few hours or the next day according to hide moisture
- Brain tanning. Pants, jackets. Cut dangly pieces or very thick parts (e.g. neck), lay the hide on beam and scrape excess meat/fat. Submerge in water in a non-metallic bucket for a few days. If it is a preserved/dried/salted hide wash it in fresh water to remove salt. Either on beam or stretched on a frame, scrape the hair, follicles and epidermis layer. Rehydrate and scrape off membrane of the other

side. Wring by twistng. In a non-metallic bucket, heat water and either 1 deer brain or 0,5kg of any other brain or 12 egg yolks and 4 tablespoons olive oil. Submerge and work the solution in hide. Let soak for a few hours or overnight. Wring it back into the bucket. Soak again and wring at least 2-4 times. Stretch the hide on frame, beams, posts, poles, by pulling. Smoke it (e.g. punk wood). Oiling

- Bark tanning. Boots, belts, bags, containers, aprons. Live bark at spring (oak, fir, chestnut, oak galls, birch, alder, willow, etc). Grind 20kg. The finer the better. Boil 80lt of water and put in plastic barrel. Throw in the bark chips. Let it sit for 15-20 days. Meanwhile, prepare your hide and salt it to preserve when finished. Drain the bark chips. In another plastic barrel add 20lt of bark solution and 55lt of fresh water and stir. Add the hide and stir for 10 minutes. Let it sit for 10 minutes and stir again for 10 minutes. Repeat this process for 1 hour. Then let the hide sit for 1 week. After the week, remove 20lt of used solution and replace them with 20lt of unused bark solution. Let it sit for another week and repeat until you run out of bark solution. Remove the hide from the barrel and rinse for two hours with cold, running water. Twist-wring it as with bark tanning. Apply neatsfoot oil, olive oil, tallow, bear fat, or fish oil to a cloth, then rub the cloth onto the surface of the hide. Rub a thick coat of oil onto the surface until the leather looks somewhat shiny. Hand the leather to dry for 24 hours and wipe any excess oil

WATERPROOFING

- Turpentine. Dilstilled pine resin
- Canvas. In low heat, melt 2 parts beeswax and then add 1 part boiled linseed oil and a little over 1 part turpentine (or white spirit). Apply with a brush. Hang the canvas to dry in a cool outdoors space for at least a couple of weeks. Linseed oil on rags can spontaneous combust at temperatures as low as 48oC, and in some conditions even lower
- Wool. Either as above using less (or even no) beeswax or soak the wool in lanolin-turpentine solution
- Leather. Same as cavas, or beeswax-pine tar combo (best), or: Ole Time Woodsman Boot Grease (beeswax-pine tar-tallow-cod oil), Huberd's Shoe Grease (beeswax/propolis-pine tar-oils?), or: Foggy Mountain Bear Guard (beeswax-bear fat), Obenauf's Heavy Duty LP (beeswax/propolis-oils?), Otter Wax Boot Wax (beeswax-lanolin-oils?), mink oil. No neatsfoot/cocconut/mineral/olive oils, or paraffin/petroleum based like Sno Seal (petroleum-paraffin-

beeswax). Field expedient: pine tar and on clean, dry, sun-warmed boots

- Linseed oil. Boiled: penetrates less, dries faster. Raw: penetrates more, way longer drying

COLD SOAP

- Lye. Boil white hardwood ashes for half an hour in non-aluminium pot. Let ashes sit and collect lye. Boil lye until it can float an egg. For a lye barrel, drill a small hole in the barrel bottom, lay a few cm of gravel, a few cm of straw, a few cm of white hardwood ash, fill with water. Place non-aluminium container under barrel to collect lye
- Soap. Molten fat, lard, vegetable oil in a pot. Pour it slowly/carefully into boiling lye and keep stirring. Avoid inhaling the toxic fumes. Pour in shallow molds

COB

- Clay:sand, 2:1 to 1:3 plus some straw. Finger clay soil test

NAVIGATION

- Latitude. Horizontal. 181 Parallels: 90N, 90S, Equator (0)
- Longitude. Vertical. 360 Meridians: 179E, 179W, Prime Meridian (0), Antimeridian (180E or 180W). IERS is 102,478m east of Greenwich
- Decimal Degrees – DD (41.606N 041.6E), Degrees Minutes Seconds – DMS (41°36′21.6″N 041°36′00″E), Decimal Minutes or Degrees Decimal Minutes – DM/DDM (41°36.36N 041°36.00E)
- Magnetic (compass), Grid (Meridians, maps), True (Geodetic, Geographic, imaginary axis). Grid and True almost the same
- Magnetic declination. Difference between Magnetic and Grid/True North. Compasses need declination adjustment after purchase and when travelling abroad. Hiking or topo maps (contour lines) usually include declination. The closer to Grid/True north pole the more crucial to adjust compass. If magnetic pole travels along your meridian you need zero adjustment. If you are perpendicular to magnetic pole's line of travel you need yearly adjustment. 2023: 86.146N 146.826E at 44km per year
- Magnetic inclination. Needle tilts upwards (towards the sky) in southern hemisphere (negative dip) and downwards (towards the ground) in the northern hemisphere (positive dip)
- Baseplate (easiest to use, can be used with a map), lensatic (more accurate bearing), mirror
- Baseplate and map navigation
 - map orienting. 1. Place your compass on the map with the direction of travel arrow pointing toward the top of the map. 2.

Rotate the bezel so that N (north) is lined up with the direction of travel arrow. 3. Slide the baseplate until one of its straight edges aligns with either the left or right edge of your map. (The direction of travel arrow should still be pointing toward the top of the map.) 4. Then, while holding both map and compass steady, rotate your body until the end of the magnetic needle is within the outline of the orienting arrow. The North of the map is now oriented towards the Grid/True North, which means that the map and your physical surrounding landscape are alligned

- map bearing. 1. Set your compass on the map so that the straight side of the baseplate lines up between your current position and the map location for a destination like a campsite. 2. Make sure the direction of travel arrow is pointing in the general direction of that campsite (in other words, it's not upside down). 3. Now rotate the bezel until the orienting lines on the compass are aligned with the north-south grid lines and/or the left and right edges of your map. (Be sure the north marker on the bezel is pointing north on the map, not south.). 4. Look at the index line to read the bearing you've just captured. 5. Hold the compass perpendicular to your chest with the direction of travel arrow pointing away from you. 6. Rotate your body until the magnetized needle is inside the orienting arrow. The direction of travel arrow is now facing the bearing you captured and you can follow it to your destination
- field bearing. 1. Start by finding a landmark that you can also identify on your map. 2. Hold your compass flat with the direction of travel arrow pointing away from you and directly at the landmark. 3. Now rotate the bezel until the magnetized needle is inside the orienting arrow. 4. Look at the index line to read the bearing you've just captured. 5. Lay your compass on the map and align one corner of the straight edge with the landmark. 6. Making sure that the direction of travel arrow remains pointed in the general direction of the landmark, rotate the entire baseplate until the orienting lines are running north/south and the north marker on the bezel is pointing to north on the map. 7. Now you can draw a line on the map along the straight edge of your compass. The point where that line from the landmark crosses your trail is your location

- triangulation. Use multiple field bearings that are at least 60 degrees away from your first landmark and from each other to verify and pinpoint more accurately where you are on a map

EQUIPMENT

- Small hatchet, knife (fixed blade, full tang, high carbon, flat grind, straight back, double bevel, 10-15cm), 6-tpi curved folding saw, cheap high carbon steak knife, folding knife, Swiss knife, machete, medium axe, sheaths, aluminum-oxide stones
- Tarp, palatka, rucksack, windproof tent, sleeping bag, pillow case, mylar blanket, bed roll, ground mat
- Fishing line .14, Dacron B50, spear gun line, paracord 550, polyester rope, bow/arrows, can of hooks/flies, rod, game/fish wool cloths
- Fur hat, wool (mittens, long johns, full face, neck gaiter, briefs, undershirt, socks/foot wraps, shirt), hooded jacket, jeans, boonie hat, xtra boots/laces, wax-tar grease, work gloves, rubber boots, rain coat, Realtree/Mossy Oak/BDU/...
- Magnesium rod, ferro rod, flint/steel, lighters, bow drill, tinder pouch, zippo pocket stove
- Nail clippers, insect/bug repellent, tooth brush, soap bars, towel, wash cloth, sewing thread/needle, comb, tooth paste, prescription meds, betadine, bandages, aspirin, aloe gel, hydrocortisone, pain killer, lions, antibiotics, toilet paper, wet wipes, rough salt
- Inox water canteen, inox mess kit, inox bottle, transpiration bags, solar still sheets, beans, rice, egg noodles, buckwheat, wheat, jerky, hardtack, biscuits, tea herbs, spoon, fork, tent stove, iron skillet, inox pots, edibles identification books
- Monocular 10x25, compass, waterproof flashlight/batteries, duct tape, rubber patches/glue, N/V goggles, topo maps, fixed spade, canoe/kayak
- Keys, IDs, cash, credit cards, cell phone/chargers, laptop/tablet/backup USBs/drives
- Arm guard, leg guards, pipe shotgun/shells

HOME/FIELD

- Find Polaris using the Big and Little Dipper
- Observe and try to read the clouds
- Find North with a shadow stick. Make a sun dial
- Make a horse shoe pack and a tarp pack
- Make some braids, splices, lashings and knots
- Cold leach some acorns
- Make some cordage

- Make a Roycroft frame and an Evenk frame
- Make snow shoes and snow goggles
- Split wood and make feather sticks
- Start a few fires with flint and steel and with a ferro rod
- Make a bow-drill and start a few fires
- Make an adjustable pot suspender, carve a wooden fork and a spoon, bow-drill a spoon
- Get some meat and air dry some jerky. Make some smoked jerky
- Weave a basket from saplings, brambles, reed or other
- Make a cob oven or other small structure
- Make a flint knife and an arrow head
- Make a self bow and arrows
- Make a bow string from animal gut and sinew
- Make a beeswax-boiled linseed oil-turpentine solution and waterproof some canvas
- Make a beeswax-pine tar-boiled linseed oil-turpentine solution and waterproof old, leather, outdoors work boots
- Make some cold soap
- Make hide glue and pine pitch
- Brain tan a hide
- Make a notebook
- Experiment to find your favorite equipment
- Make a Go Bag and an INCH Bag

FIELD

- Make a trip to your local backwood area to familiarize with baseplate and topo map navigation
- Research your local flora very well and forage a few edibles
- Rub some insect repellent plants on your clothes to see how they work
- Dirty your hands and wash them with white ash and water or sand and water
- Go tracking and identify local fauna
- Harvest acorns, tinder fungus, punk wood, dead bark, material for the five components of a bow-drill, cordage plants, flint stones, pine sap
- Make a solar still and use a few transpiration bags
- Make a Dakota fire pit
- Set up a hammock, a hammock chair, a tarp chair, a hunter's chair, a tepee, a tent

- Mold some clay pottery and cook them in an earth oven
- Build a debris hut, a dirt trench, a lean-to and a fire wall
- Make a Siberian log fire
- Find a proper tree and make bow staves for seasoning
- Make a log raft
- Overnight sleep in tent
- Overnight sleep in open shelter
- Research your local laws and practice spear fishing, bow fishing, trapping and bow hunting

EDIBLES

- *Picea abies* (norway spruce, ερυθρελάτη): needles, cambium, pollen catkins (male cones), immature female cones, seeds, shoots [roundish needles]
- *Pinus halepensis* (aleppo pine, χαλέπιος πεύκη): needles, cambium, catkins, cones, seeds [roundish crown, cones backwards]
- *Pinus brutia* (turkish pine, τουρκική πεύκη): needles, cambium, catkins, cones, seeds [roundish crown, cones forward]
- *Pinus nigra* (black pine, μαύρη πεύκη): needles, cambium, catkins, cones, seeds [pyramid spacey crown, cones transverse]
- *Pinus pinea* (stone pine, ήμερη πεύκη/κουκουναριά): needles, seeds [mushroom crown, cones roundish transverse]
- *Fagus sylvatica* (beech, οξιά): leaves, seed (toxic in large quantity)
- *Pyrus amygdaliformis* (almond-leaved pear, γκορτσιά): leaves, fruit, twig decoction
- *Ulmus glabra* (wynch elm, βουνοφτελιά): leaves, samaras, cambium
- *Ulmus procera* (english elm, ψηλή φτελιά): leaves, samaras, cambium
- *Ulmus minor* (field elm, καμποφτελιά): leaves, samaras, cambium
- *Pistacia terebinthus* (cyprus turpentine, κοκορέτσα): seed, leaves cooked
- *Tilia tomentosa* (silver lime, φιλύρα/τιλιά/φλαμουριά): leaves
- *Tilia cordata* (small leaved lime, φιλύρα/τιλιά): leaves, sap
- *Tilia platyphyllos* (large leaved lime, φιλύρα/τιλιά): leaves, sap
- *Tilia rubra* (red twigged lime, φιλύρα/τιλιά): leaves, sap
- *Acer sempervirens* (Cretan maple, σφένδαμος): leaves, samaras, sap
- *Acer pseudoplatanus* (sycamore/maple, σφένδαμος): leaves, samaras, sap
- *Populus alba* (white poplar, λευκή λεύκη): leaves, cambium [lobed leaves]
- *Populus nigra* (black poplar, μαύρη λεύκη): cambium [spade leaves]

- *Populus tremula* (trembling aspen, λεύκη η τρέμουσα): cambium [roundish serrated leaves]
- *Morus alba* (white mulberry, λευκή μουριά): leaves/shoots cooked, berries, shoots tea, sap, cambium
- *Morus nigra* (black mulberry, μαύρη μουριά): berries
- *Salix alba* (white willow, λευκή ιτιά): leaves & shoots (may be toxic), cambium
- *Salix triandra* (almond-leaved willow, αμυγδαλόφυλλη ιτιά): leaves, shoots cooked, cambium
- *Salix purpurea* (purple osier willow, πορφυρή ιτιά): leaves & shoots cooked (may be toxic), cambium
- *Salix eleagnos* (bitter willow, ελαίαγνος ιτιά): shoots, cambium
- *Salix babylonica* (weeping willow, ιτιά κλέουσα): leaves & shoots cooked, cambium
- *Salix cinerea* (grey willow, σταχτοϊτιά): N/A
- *Salix amplexicaulis* (stem clasping willow, περίβλαστη ιτιά): N/A
- *Quercus coccifera* (kermes oak, πουρνάρι): acorns leached [small thorny leaves]
- *Quercus petraea* (sessile oak, δέντρο): acorns leached [no acorn stalk]
- *Quercus robur* (english oak, ρουπάκι): acorns leached [long acorn stalk]
- *Quercus aegilops* (valonia oak, βελανιδιά): acorns leached [fluffy husks, no acorn stalk, serrated leaves]
- *Quercus cerris* (turkey oak, τσέρο): acorns leached
- *Castanea sativa* (european chestnut, καστανιά): seed
- *Juglans regia* (english walnut, καρυδιά): seed, sap
- *Ceratonia siliqua* (carob, χαρουπιά): seeds, seed pods
- *Arbutus unedo* (strawberry tree, κουμαριά): fruit
- *Ficus carica* (fig, συκιά): fruit
- *Robinia pseudoacacia* (black locust, ψευδακακία): seeds cooked only, flowers
- *Juniperus drupacea* (syrian juniper, συριακή άρκευθος/δενδρόκεδρος): cones (berries)
- *Cupressus sempervirens pyramidalis/horizontalis* (italian cypress, ορθόκλαδο/πλαγιόκλαδο κυπαρίσσι): green cone decoction
- *Fraxinus ornus* (manna ash, μικρός φραξός/μελιά): processed sap
- *Fraxinus oxycarpa* (narrow-leaved ash, στενόφυλλος φραξός/μελιά): N/A

- *Taxus baccata* (yew, ίταμος): only the red aril, all other parts including the seed are poisonous
- *Medicago arborea* (moon trefoil, δενδρώδης μηδική): leaves, shoots
- *Rubus fruticosus* (blackberry, βατόμουρο): berries, shoots, leaves tea, root cooked
- *Smilax aspera* (rough bindweed, αρκουδόβατος): leaves, shoot, root
- *Phragmites australis* (reed, καλαμιά): leaves, stem, shoots, seed, root
- *Prunus spinosa* (blackthorn, τσαπουρνιά): berries, leaves tea
- *Crataegus monogyna* (hawthorn, κράταιγος): leaves tea, berries, shoots, flowers, seeds coffee
- *Rosa canina* (dog rose, κυνόροδο/αγριοτριανταφυλλιά): berries, flower, seed
- *Laurus nobilis* (grecian laurel, δάφνη/βάγια): leaves & fruit dried
- *Cistus creticus* (rock rose, κουνούκλα): leaves tea
- *Clematis vitalba* (evergreen clematis, κληματσίδα/κούρμπενο): leaves & shoots cooked (may be toxic to some people)
- *Sonchus oleraceus* (sow thistle, ζοχός): leaves, stem, root
- *Taraxacum officinale* (dandelion, πικραλίδα): leaves, flower, root
- *Reichardia picroides* (galatsida, γαλατσίδα [για τη δηλητηριώδη γαλατσίδα βλ. πιο κάτω]): leaves, root
- *Cichorium spinosum* (spiny chicory, σταμναγκάθι): leaves
- *Cichorium intybus* (chicory, ραδίκι): leaves, flower, root
- *Portulaca oleracea* (little hogweed, αντράκλα): leaves, seed
- *Eruca vesicaria sativa* (rocket, ρόκα): leaves, stem, flower
- *Tordylium apulum* (mediterranean hartwort, καυκαλήθρα): leaves
- *Melissa officinalis* (lemon balm, μελισσόχορτο): φύλλα
- *Urtica dioica* (nettle, τσουκνίδα): leaves, shoots
- *Amaranthus blitum* (slender amaranth, βλίτο): leaves, seed cooked
- *Amaranthus retroflexus* (pigweed, άγριο βλίτο): leaves, seed
- *Rumex acetosa* (sorrel, λάπαθο): leaves, flowers cooked, seed, root cooked
- *Foeniculum vulgare* (fennel, μάραθο): leaves, stem, seed, flower, root, [mild toxic to some people]
- *Capparis spinosa* (caper, κάπαρη): leaves, shoots, buds
- *Parietaria judaica* (Pellitory Of The Wall, περδικάκι): leaves, stem
- *Vicia cracca* (bird vetch, αγριόβικος): leaves cooked, seed cooked
- *Silybum marianum* (milk thistle, γαϊδουράγκαθο): leaves, stem, flower, root

- *Cynara cardunculus* (cardo, αγριαγγινάρα): leaves, stem, flower, root cooked
- *Allium neapolitanum* (white garlic, αγριοκρέμμυδο): leaves, flower, root
- *Asparagus officinalis* (asparagus, σπαράγγι): shoots, stem, seed coffee
- *Muscari comosum* (tassel hyacinth, βροβιά): root cooked
- *Daucus carota* (wild carrot, αγριοκαρότο): dried flower, root cooked, seed coffee
- *Galium aparine* (sticky willies, κολλητσίδα): leaves, shoots, seed coffee, dried plant decoction, mild toxic sap
- *Echinochloa crus-galli* (barnyard millet, μουχρίτσα): leaves, shoots, seed cooked or flour or coffee
- *Mirabilis jalapa* (Marvel Of Peru, νυχτολούλουδο/δειλινό): leaves cooked
- *Avena barbata/byzantina/sterilis* (slender/red/sterile oat, λεπτή/ερυθρά/άγονη αγριόβρωμη): seed sprouted or cooked or flour
- *Hordeum murinum* (wild barley, αγριοκρίθαρο): seed sprouted or cooked or flour
- *Lolium perenne* (perennial ryegrass, πολυετής ήρα): seed cooked
- *Lolium subulatum* (ryegrass, ήρα): N/A
- *Sorghum halepense* (johnson grass, καλαμάγρα): seed raw or cooked or flour
- *Papaver rhoeas* (poppy, παπαρούνα): leaves, flower, seed
- *Sideritis* (ironwort, τσάι του βουνού): leaves/flowers/stem tea
- *Matricaria chamomilla* (chamomile, χαμομήλι): flowers/shoot/stem tea
- *Salvia officinalis* (sage, φασκόμηλο): leaves, shoots, flowers
- *Salvia rosmarinus* (rosemary, δεντρολίβανο): leaves, shoots, flowers
- *Origanum vulgare* (oregano, ρίγανη): leaves, stem, flowers
- *Thymus vulgaris* (thyme, θυμάρι): leaves, shoots, flowers
- *Satureja hortensis* (summer savory, θρούμπι): leaves, shoots

- *Malus domestica* (apple, μηλιά): leaves, fruit
- *Olea europaea* (olive, ελιά): leaves, fruit, sap
- *Castanea sativa* (european chestnut, καστανιά): seed
- *Juglans regia* (english walnut, καρυδιά): seed, sap
- *Pyrus communis* (pear, αχλαδιά): leaves, fruit
- *Prunus cerasus* (sour cherry, βυσσιλιά): fruit

- *Prunus avium* (sweet cherry, κερασιά): fruit
- *Prunus amygdalum* (almond, αμυγδαλιά): seed
- *Corylus avellana* (hazel, φουντουκιά): seed
- *Cydonia oblonga* (quince, κυδωνιά): fruit, flowers
- *Vitis vinifera* (grape vine, αμπέλι): leaves, grape, flowers, shoots
- *Triticum aestivum* (bread wheats, σιτάρι): seed
- *Vicia sativa* (vetch, βίκος): leaves, shoots, seed
- *Vicia villosa* (winter vetch, βίκος): leaves, shoots
- *Trifolium repens* (white clover, τριφύλλι): leaves, flower, root

TOXIC – POISONOUS

- *Abies cephalonica* (greek fir, κεφαλονίτικη ελάτη): no edible parts, toxic needles
- *Platanus orientalis* (oriental plane, πλάτανος): no edible parts
- *Ailanthus altissima* (tree of heaven, αείλανθος ο υψηλότατος): no edible parts, toxic and poisonous
- *Vachellia farnesiana* (sweet acacia, μιμόζα/γαζία): no edible parts
- *Nerium oleander* (oleander, πικροδάφνη): no edible parts, all parts highly poisonous
- *Hedera helix* (ivy, κισσός): no edible parts, toxic and poisonous
- *Euphorbia peplus* (petty spurge, γαλατσίδα [για τη βρώσιμη βλ. πιο πάνω]): no edible parts, toxic sap
- *Scilla maritima* (squill, μμποσίκι): no edible parts, toxic sap, poisonous bulb
- *Spartium junceum* (spanish broom, σπάρτο): no edible parts, toxic, poisonous seeds
- *Cynodon dactylon* (bermuda grass, αγριάδα): no edible parts, toxic
- *Cuscuta campestris* (dodder, κουσκούτα): no edible parts
- *Lolium temulentum* (darnel, μεθυστική ήρα): edible seed but usually infested by very toxic fungus
- *Datura stramonium* (thorn apple, διαβολόχορτο): no edible parts, all parts highly poisonous
- *Xanthium strumarium* (cocklebur, αγριομελιτζάνα): no edible parts, toxic and poisonous
- *Phlomis fruticosa* (Jerusalem Sage, ασφάκα): N/A

LOOK-ALIKE PLANTS

- Wild carrot vs poison hemlock: hairy stem vs smooth stem, uniform stem vs purple spotted stem, smell like carrot vs smell like urine

- Poison yew vs conifers: yew has flat leaves with a central spine underneath and grow lateral or spiral on the stem, reddish-brown flaked trunk
- Poison ivy vs Rubus species: poison ivy leaves have smooth surface and edges, no thorns, no serrated parts, grows in leaves of three, no side by side triplets
- Smilax vs toxic dog-strangling vine: smooth and shiny leaves vs dull leaves, thin leaves vs meaty leaves
- Toxic darnel vs ryegrass: darnel's ears are so closer to each other than ryegrass' that they make the stem to zig-zag
- Laurel/bay vs poisonous oleander: leaves light green, little wide, somewhat serrated vs leaves dark green, thin and long, smooth on all sides [not because they look alike but because they share the same name in Greek]

