TRICKS FOR OUTDOOR LEADERS - FORMULAS, HINTS, AND HANDY CALCULATIONS

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1. The sun moves 15 degrees of arc per hour. At arms length, your palm (four fingers) covers approximately 15 degrees, or one hour. Number of palms between sun and horizon is number of hours after sunrise or before sunset. If a palm = an hour, then each finger = 15-minutes.

2. Accident Potential

Environmental Hazards	X	Human Factor Hazards	=	Accident Potential
2	X	3	=	6 times higher potential
3	X	4	=	12 times higher potential

3. Try to keep uphill steps to a rise of not more than 6". Two small steps use less energy than one big step.

4. Distance vs time [1] Average hiking speed on flat terrain = 30-minutes per mile (1.6K), thus 1-hr = 2-mi (3.2K). Set a special day to determine your average hiking speed on flat terrain. You'll have to do this with a day pack, then a back-pack, to get respective time/distance estimates for yourself.

a. Add 1-hr for each 1,000-ft (305-m) of ascent.
b. Plan a 5-minute break each hour.
c. When by yourself or leading a group, add time [2]:
   (1) For folks to catch up,
   (2) To tie shoe laces,
   (3) To adjust gear, and etc.
   (4) At altitude: Cooking takes longer, breathing takes longer.
   (5) Bad knees = longer hiking downhill.
   (6) For breaking or making camp.
   (7) For a morning snack.
   (8) For lunch.
   (9) For an afternoon snack.
   (10) For View point stops.
   (11) For photographs (autumn colors, views, spring flowers, and etc.).
   (12) Cold weather: Everything is ***s l o w e r*** when it's cold.
      (a) Hike so the group does not overheat and sweat.
      (b) Setting up tent takes longer.
      (c) Cooking takes longer.
      (d) Getting warm takes longer.
d. Wet weather: Slippery = dangerous, and takes longer.
e. Rocky travel, takes longer.

5. Temperature:
a. Centigrade to Fahrenheit: (__°C x 9/5) + 32 = __°F
b. Fahrenheit to Centigrade: (__°F - 32) x 5/9 = __°C
c. Crickets [3]:
   (1) Number of chirps per minute, subtract 40, divide by 4, then add 50 for approximate temperature Fahrenheit
   (2) Cricket versus temperature formula developed in 1897 - Number of cricket chirps in 15 seconds + 39 = temperature Fahrenheit. Accurate to + / - 1° F
d. Rhododendron [4]:
   60 °F / 15 °C leaves spread out
   40°F / 4°C leaves drooped
   30°F / -1°C leaves curled
   20°F / -6°C leaves tightly curled
   Ed Note: The leaves also curl tightly in drought conditions.
e. Adiabatic lapse rate, the normal temperature drop with altitude (all other considerations being equal):
   3° per 1,000-ft;
   3.5° per 1,000-ft at higher altitude

6. Lightning [5]:

a. Number of seconds between lightning flash to hearing sound, divided by five = approximate distance you are from lightning strike.
b. When lightning is 15-seconds or less away, lightning is within 3-miles or less and *you should take immediate defensive action* [6].
c. If you can hear thunder, you're near enough to get hit by lightning [7].

7. Miles (statute) - Miles (nautical) - Kilometers

a. Kilometers x 0.6214 = Miles (statute)
b. Miles (statute) x 1.609 = Kilometers
c. Miles (nautical) x 1.853 = Kilometers
d. Miles (statute) x 0.8684 = Miles (nautical)
e. Miles (nautical) x 1.1516 = Miles (statute)

8. A person's normal daily water requirement.

To determine your normal daily water requirement [8]. Divide your weight by 2 to determine fluid ounces to be consumed daily. Divide the number of fluid ounces by 8 to determine number of glasses of water to be consumed daily.

Example: 160 pounds ÷ 2 = 80 fluid ounces, then 80 ÷ 8 = 10 glasses.

To simplify this; divide your weight by 16.

Example: 160 pounds ÷ 16 = 10 glasses.

Please remember: Strenuous activity such as hiking and backpacking and other sports, and heat or cold, may drastically *increase* these *basic* requirements. Besides, the water source you count on up the trail a ways may be dry. Be sure to carry enough water for you and for emergencies. You can do without food for a number of days. A shortage of water will effect you more seriously *and* much more quickly.

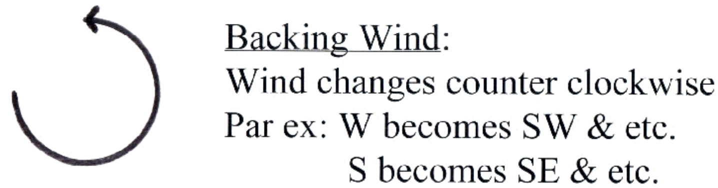
9. Wind [9]:

a. Upslope = daytime
b. Downslope = night
c. Onshore = daytime
d. Offshore = night

NOTE: Paragraphs 9.e. through 9.h. apply to the Northern Hemisphere. In the Southern Hemisphere things are just the opposite.

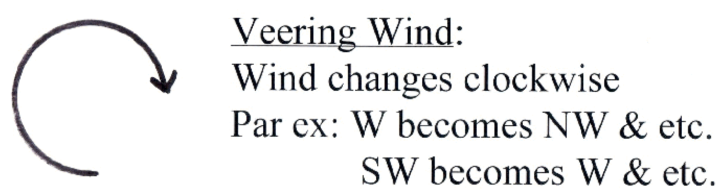
e. Backing wind (see sketch), wind swings in a counter-clockwise fashion, indicates approach of low pressure, possibly bad weather.

f. Wind flows counterclockwise around and into a LOW. Air in a LOW rises.



g. Veering wind (see sketch), wind swings in a clockwise fashion, indicates high pressure, indicates possibly clearing weather.

h. Wind flows clockwise around and out from a HIGH. Air in a HIGH subsides.



Endnotes:

1. The Backpacker's Field Manual, pg 9
2. Handout Author
3. The Backpacker's Field Manual, pg 177 & National Wildlife magazine, Oct-Nov 91 p15
4. The Backpacker's Field Manual, pg 177
5. The Backpacker's Field Manual, pg 174
6. The Backpacker's Field Manual, pg 212, or come to TATC Backpacking Seminar
7. National Public Radio
8. In accordance with what Dr. Jason Bradecich, D.C. (guest speaker and chiropractor) related at the TATC meeting on 12 February 2003. (First Colonial Chiropractic, P.C., Dr. Jason Bradecich, D.C., 1139 First Colonial Road, Virginia Beach, Virginia 23454, telephone [757] 496-4956).
9. The Backpacker's Field Manual, pg 166