Rural Training Center – Thailand (RTC-TH)

FOCUS

Community-based Environmental Education for the Self-sufficiency and Sustainability of Small Rural Family Farms

Basic MEWS Weather Observing Lesson B3: Estimating Wind Direction

2012 Ed

A Mobile Emergency Weather Station (MEWS) Training Series presentation

Rural Training Center-Thailand
Emergency Communications Program

Ready To Serve And Sustain Our Community

For other lessons in the series e-mail hsØzhm@gmail.com
Or visit www.neighborhoodlink.com/RTC-TH_Tech/pages

MEWS is part of the RTC-TH EmComm Program

The Rural Training Center-Thailand Emergency Communications program is a volunteer effort to provide emergency amateur radio communications for local community self-sufficiency and sustainability in times of need.

The Rural Training Center-Thailand (RTC-TH)

is an all volunteer organization providing community-based environmental education for self-sufficiency and sustainability of small rural family farms

www.neighborhoodlink.com/org/rtcth

E-mail: rtc2k5@gmail.com

MEWS adapts weather lessons from two existing RTC-TH programs

E-mail: rtc2k5@gmail.com
www.neighborhoodlink.com/RTCTH_Tech/pages

The Rural Training Center-Thailand was created to honor the life and memory of Mr. Tang Suttisan, a father, farmer and former custodian of Ban Na Fa Elementary School who appreciated and valued education.

Photos from the Internet; educational fair use clause

Wind affects the health / well-being and food / water needs of disaster survivors. It is valuable information for disaster relief planners. This data can be easily obtained and reported by well-trained amateur radio operators.

Photos from the Internet; educational fair use clause

Wind can make people feel warmer or colder depending on existing conditions. Excessive winds can damage tents and cause dehydration. Constant winds at 15 km/h disturbs most people. Winds can intensity fires.

Wind affects flight operations. Local amateur radio operators trained in weather observing can provide important local weather data to disaster relief authorities.

Helicopters fly into the dominant wind direction to land. Knowing the wind direction at the landing zone is important for flight safety.

Photos from the Internet; educational fair use clause

Wind direction affects decontamination efforts

Photos from the Internet; educational fair use clause

Wind direction can affect plans for setting up tents and temporary shelters

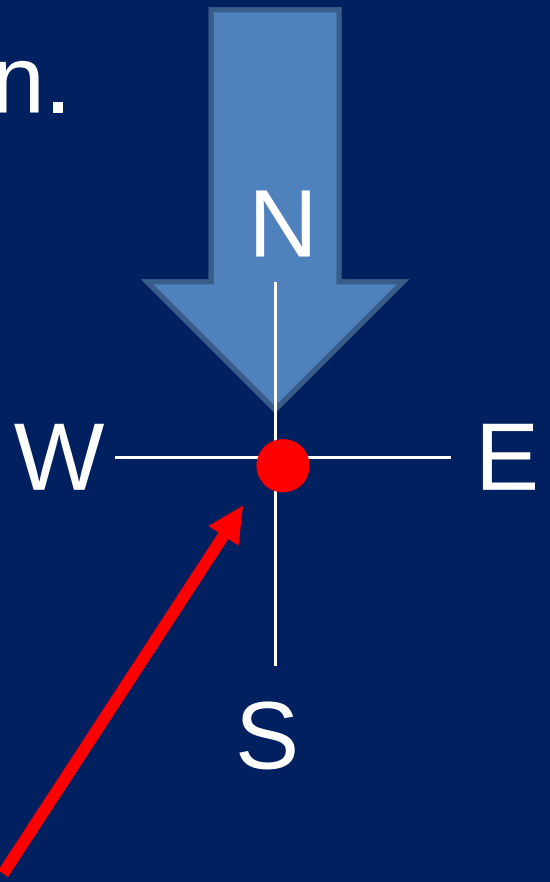
Seeing signs of wind

Photos from the Internet; educational fair use clause

The most common signs of wind are blowing dust, smoke plumes, or flags.

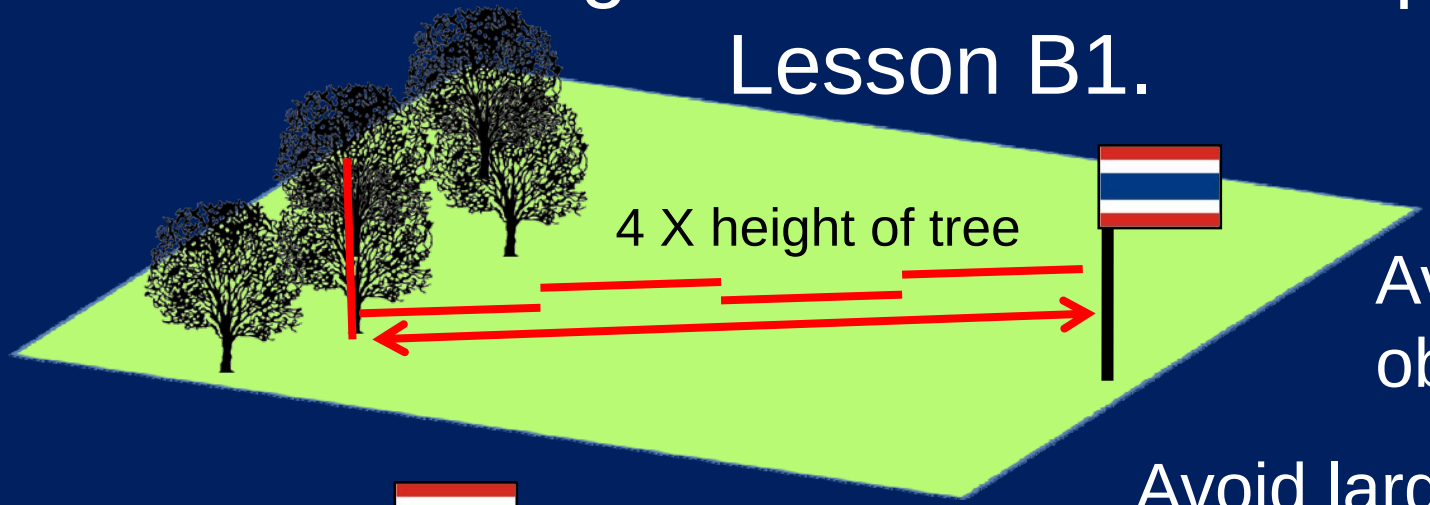
Winds are named for the direction **FROM** which they come relative to your position.

This wind is blowing from North to South is called a “North Wind” because it comes from the North.

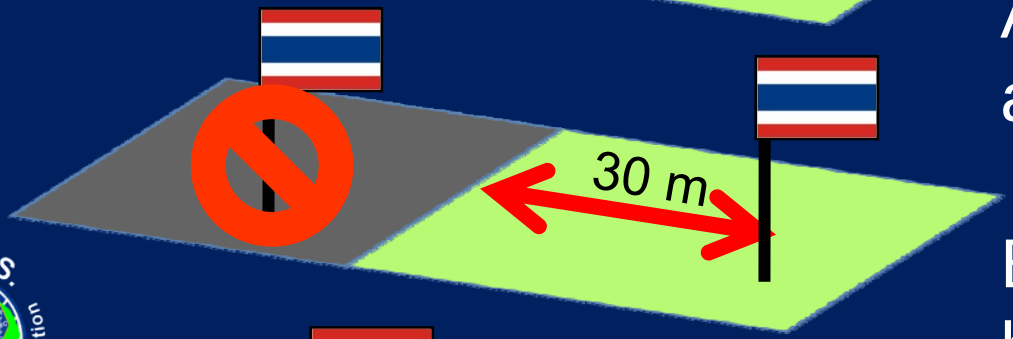


Flag / Wind Sock Placement

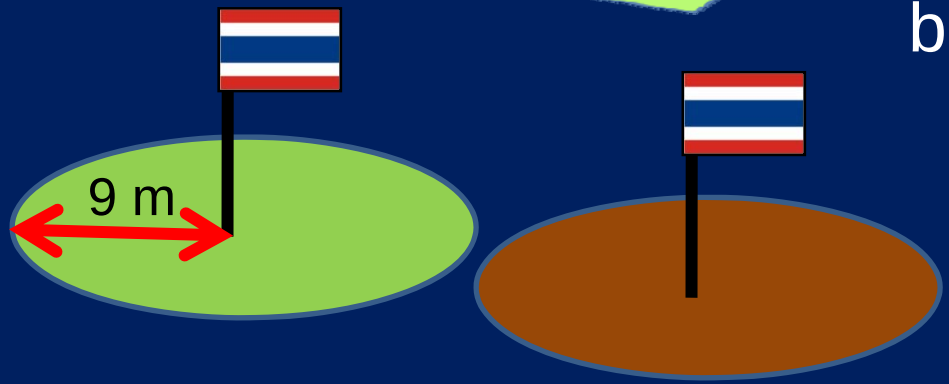
Follow same guidelines as for Temperature in Lesson B1.



Avoid to tall obstructions



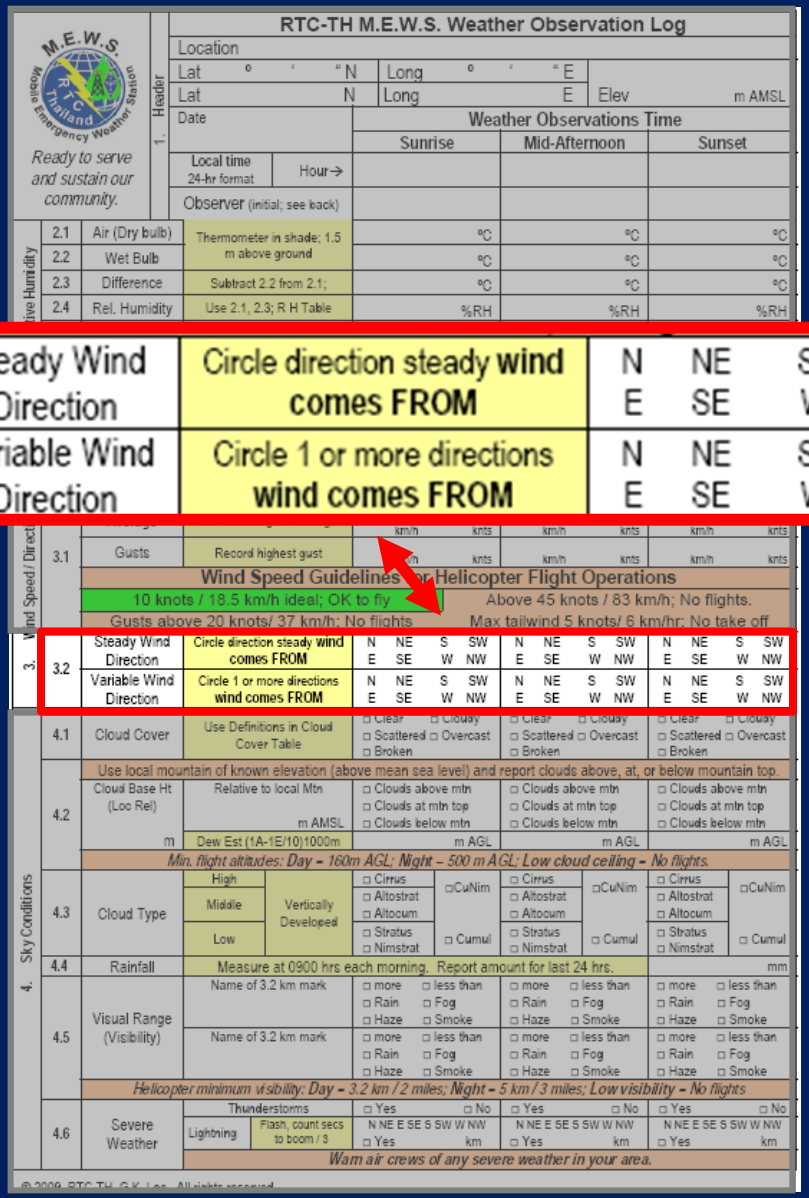
Avoid large paved areas



Best over short grass or bare soil (~9 m radius)

No flag available; you can stand where the flag should be. Face into the wind.

The MEWS Weather Observation Log Form



RTC-TH M.E.W.S. Weather Observation Log

Location

Lat ° ' " N Long ° ' " E

Lat N Long E Elev m AMSL

Date | Weather Observations Time: Sunrise | Mid-Afternoon | Sunset

Local time 24-hr format | Hour→

Observer (initial; see back)

2.1	Air (Dry bulb)	Thermometer in shade; 1.5 m above ground	°C	°C	°C
2.2	Wet Bulb		°C	°C	°C
2.3	Difference	Subtract 2.2 from 2.1;	°C	°C	°C
2.4	Rel. Humidity	Use 2.1, 2.3; R H Table	%RH	%RH	%RH

3.1	Gusts	Record highest gust	km/h knts	km/h knts	km/h knts

Wind Speed Guidelines for Helicopter Flight Operations

10 knots / 18.5 km/h ideal; OK to fly — Above 45 knots / 83 km/h; No flights.

Gusts above 20 knots/ 37 km/h: No flights — Max tailwind 5 knots/ 6 km/hr: No take off

3.2	Steady Wind Direction	Circle direction steady wind comes FROM	N NE E SE S SW W NW	N NE E SE S SW W NW	N NE E SE S SW W NW
	Variable Wind Direction	Circle 1 or more directions wind comes FROM	N NE E SE S SW W NW	N NE E SE S SW W NW	N NE E SE S SW W NW

4.1	Cloud Cover	Use Definitions in Cloud Cover Table	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken

Use local mountain of known elevation (above mean sea level) and report clouds above, at, or below mountain top.

4.2	Cloud Base Ht (Loc Rel) m	Relative to local Mtn m AMSL	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn
		Dew Est (1A-1E/10)1000m	m AGL	m AGL	m AGL

Min. flight altitudes: Day – 160m AGL; Night – 500 m AGL; Low cloud ceiling – No flights.

4.3	Cloud Type	High / Middle / Low — Vertically Developed	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat □ CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat □ CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat □ CuNim □ Cumul
4.4	Rainfall	Measure at 0900 hrs each morning. Report amount for last 24 hrs.			mm
4.5	Visual Range (Visibility)	Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke
		Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke

Helicopter minimum visibility: Day – 3.2 km / 2 miles; Night – 5 km / 3 miles; Low visibility – No flights

4.6	Severe Weather	Thunderstorms — Lightning — Flash, count secs to boom / 3	□ Yes □ No N NE E SE S SW W NW □ Yes km	□ Yes □ No N NE E SE S SW W NW □ Yes km	□ Yes □ No N NE E SE S SW W NW □ Yes km

Warn air crews of any severe weather in your area.

Basic Wind Direction is recorded in Section 3.2

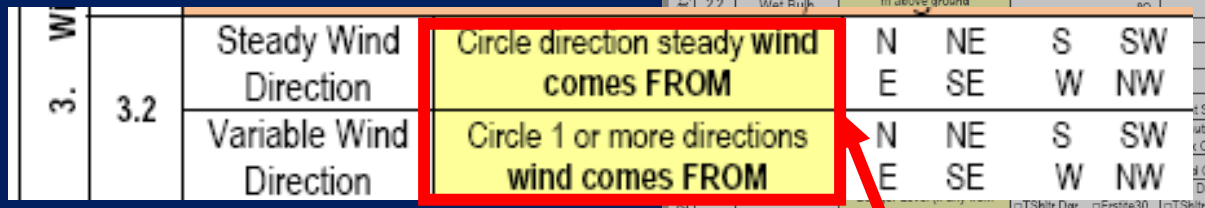
Wind directions are recorded for both steady winds and variable winds.

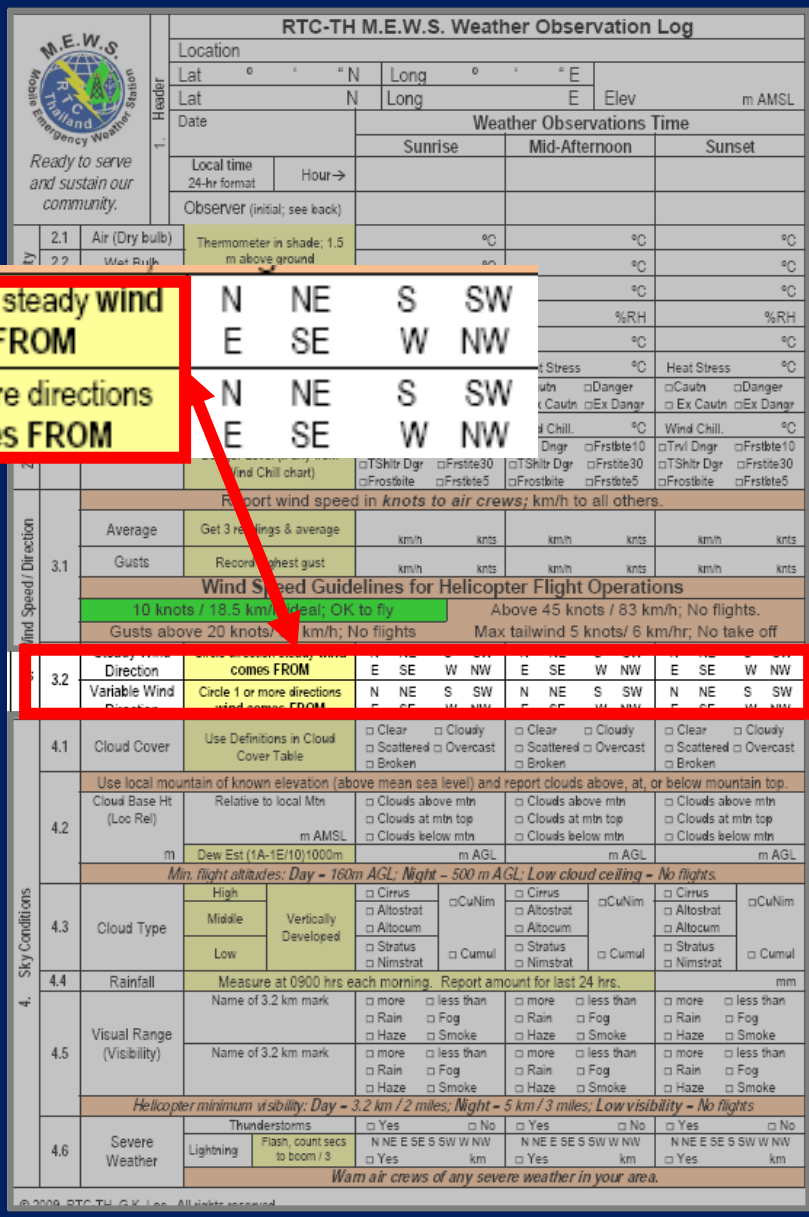
Avoid confusion and errors: report all azimuths are Magnetic (relative to Magnetic North)

See Handbook: 3.2 Wind Direction, p. 20-21

The MEWS Weather Observation Log Form

Brief instructions are on the front of the Log form.





Additional notes are on the back of the form. Full instructions and all needed reference tables are in the MEWS Weather Observer Handbook.

See Handbook: 3.2 Wind Direction, p. 20-21

The notes on the back of the log form

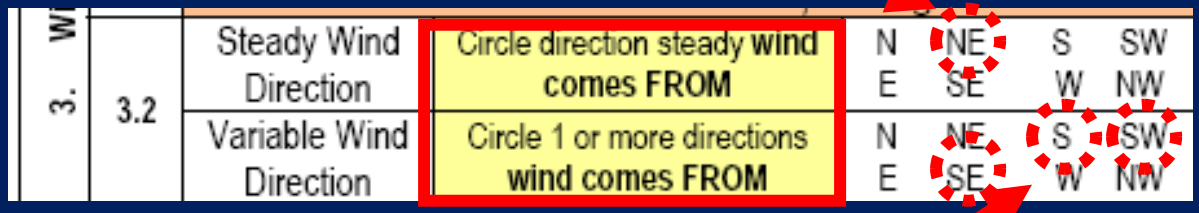
Wind Speed / Direction

3.1 Average and Gust Wind speeds: Use Beaufort Table or direct measurements 3 times and average results. Gusts are short, strong blasts of wind. *Report wind speeds in knots to air crews. Advise air crews when wind speeds are close to affecting helicopter flight operations.*

3. Wind Speed / Direction	3.1	Report wind speed in ***knots to air crews;*** km/h to all others.																	
		Average	Get 3 readings & average	km/h		knts		km/h		knts		km/h		knts	
		Gusts	Record highest gust	km/h		knts		km/h		knts		km/h		knts	
		Wind Speed Guidelines for Helicopter Flight Operations																	
		10 knots / 18.5 km/h ideal; OK to fly								Above 45 knots / 83 km/h; No flights.									
		Gusts above 20 knots/ 37 km/h; No flights								Max tailwind 5 knots/ 6 km/hr; No take off									
	3.2	Steady Wind Direction	Circle direction steady wind comes FROM	N E	NE SE	S W	SW NW	N E	NE SE	S W	SW NW	N E	NE SE	S W	SW NW
		Variable Wind Direction	Circle 1 or more directions wind comes FROM	N E	NE SE	S W	SW NW	N E	NE SE	S W	SW NW	N E	NE SE	S W	SW NW

3.2 Steady or Variably blowing winds. If steady, circle letter for direction. If variable, circle all appropriate letters for directions.

Steady wind, circle direction wind comes from.



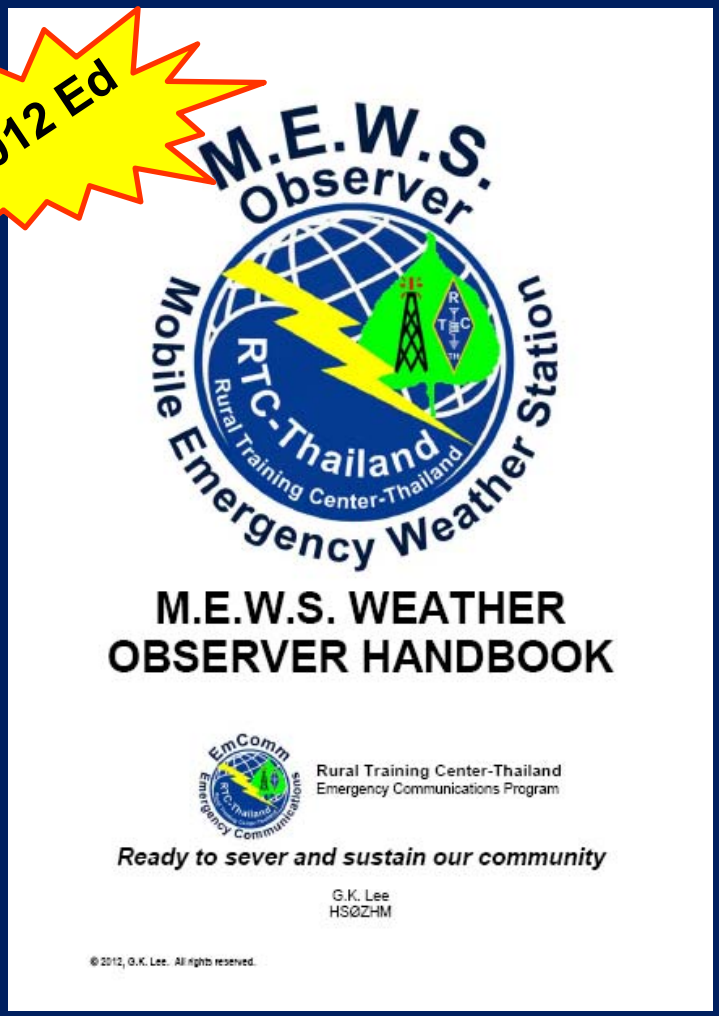
Variable wind, circle directions wind comes from.

Full instructions and all needed reference tables are in the MEWS Weather Observer Handbook.

See Handbook: 3.2 Wind Direction, p. 20-21

The MEWS Weather Observer Handbook

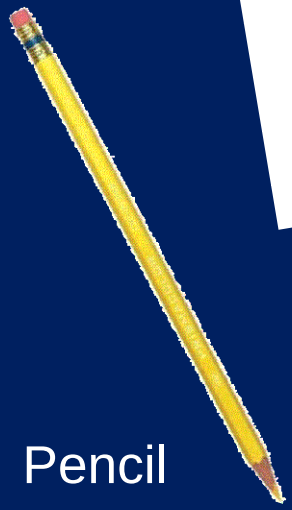
contains detailed instructions to complete the form and reference tables to speed calculations and math conversions.



What you need to make a Basic Wind Direction Measurement

2012 Ed

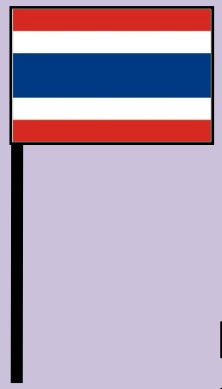
MEWS Handbook and Log Form



Pencil

Optional Equipment

Flag or wind sock



Magnetic Compass

You need to know the “cardinal” directions: N, S, E, W

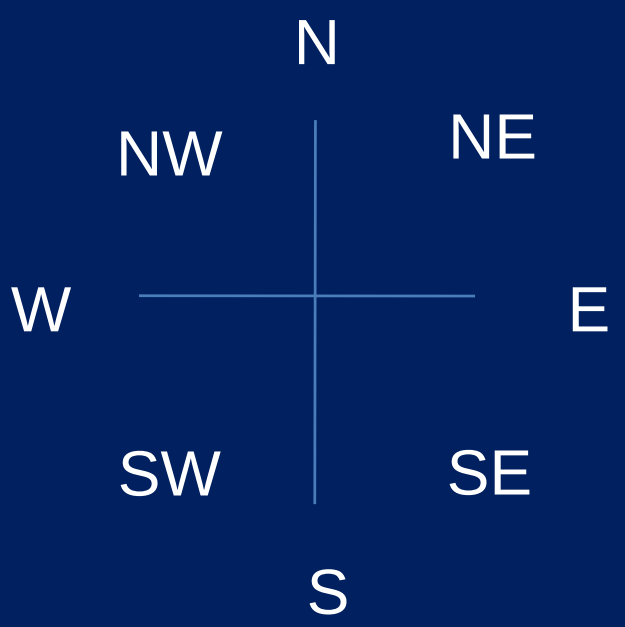
- If you are familiar with the area, you may already know the directions.
- If you are in an unfamiliar area, a magnetic compass is useful.

Photo from the Internet; educational fair use clause

Casual observation vs. Measurement

You can call the wind by its directional name or azimuth (degree) number.

Just be sure you face directly into the wind.



N = 0° or 360°
NE = 45°
E = 90°
SE = 135°
S = 180°
SW = 225°
W = 270°
NW = 315°

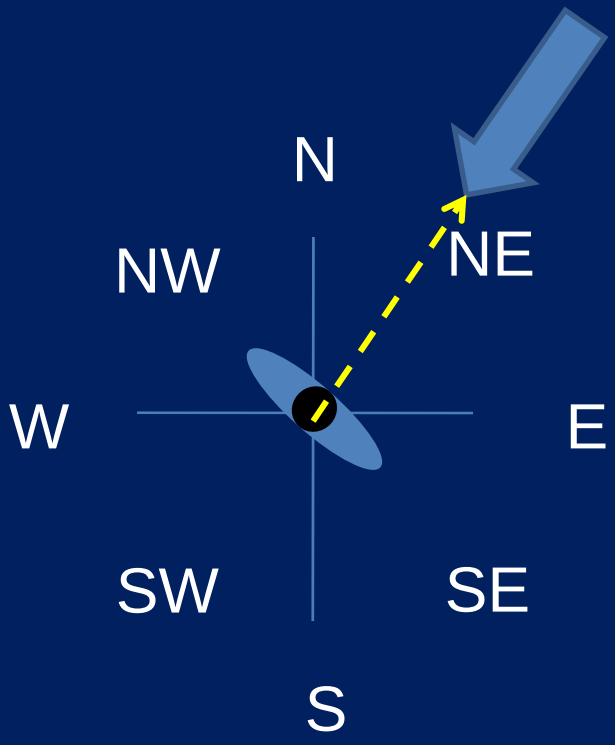
In an emergency, use names rather than numbers. Numbers imply more precision which may or may not be the case.

Casual observation

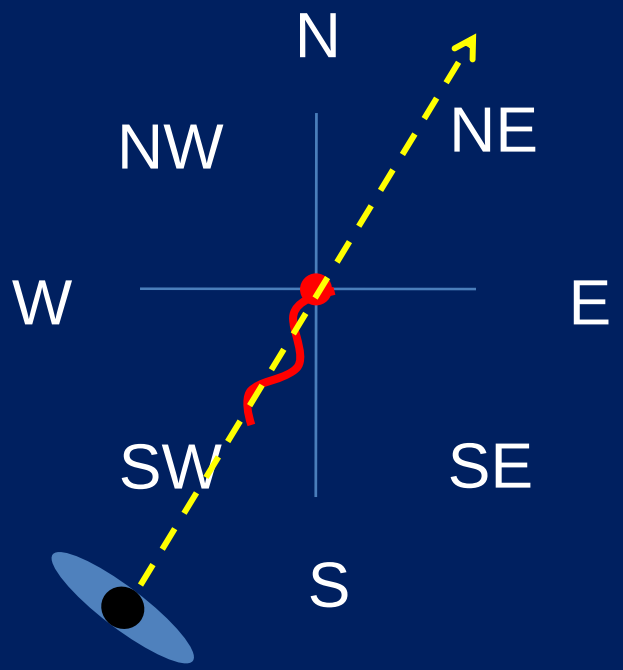
You can call the wind by its directional name.

Just be sure you face directly into the wind.

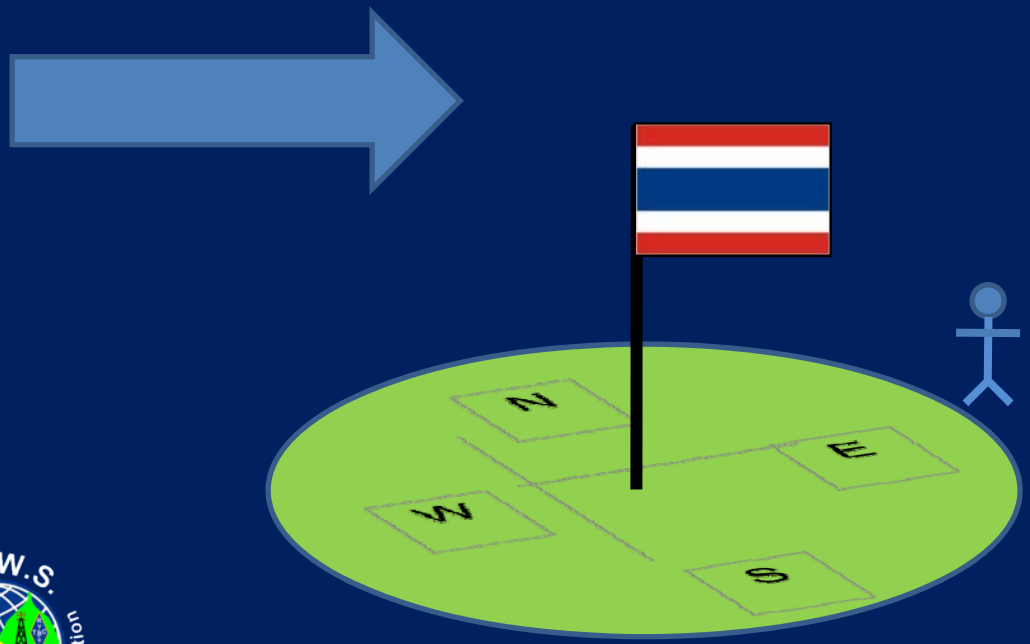
Remember, the wind direction is named by the direction it comes **FROM**.



If you have a flag, you can use it.



You can use a flag or wind sock as a wind direction indicator



Stand behind the flag. Line up with the flag, face into the wind and name the direction.

If you are using a magnetic compass, be sure you are not too close to a metal flag pole that can distort the magnetic compass reading.

In an Emergency Use Direction Names

Measured Azimuths (Direction Numbers) imply measurement and precision. People receiving the report might be misled by the implied precision.

Remember, the wind direction is named by the direction it comes **FROM**.

Reporting wind direction by names (e.g. North, Southeast, etc) avoids possible measurement errors, errors of omission (e.g. forgetting to state if directions are referenced to True or Magnetic North), or errors in correcting for magnetic declination. In an emergency, ***KEEP IT SIMPLE***.

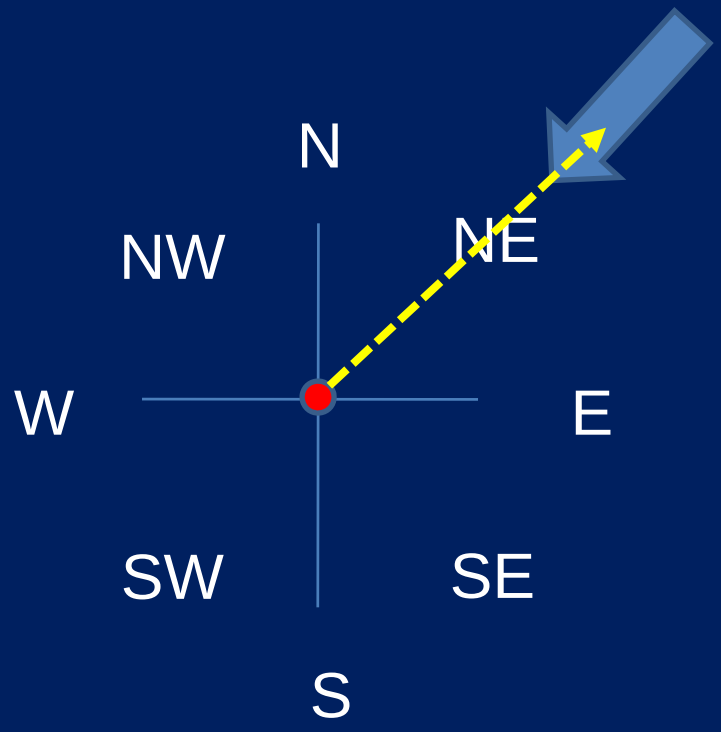
See the addendum after the lesson to learn how to measure wind direction using azimuths.

Using a magnetic compass to measure wind direction

Step 1. Get in an open area.

Step 2. Face directly into the wind

Step 3. Hold the compass level and read the direction the wind comes FROM.

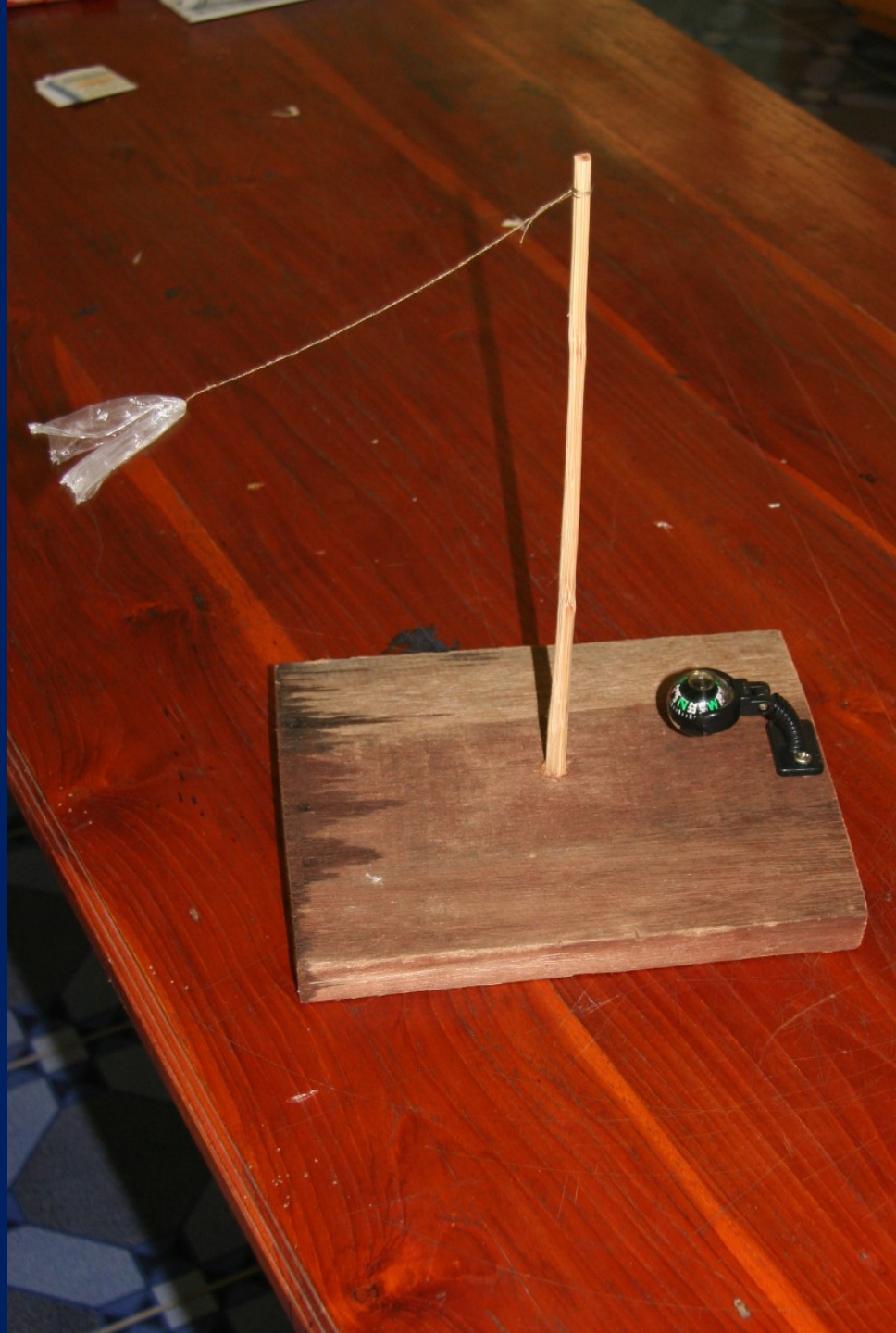


This is a NE wind.

Using a Wind Tell "Tail" to measure wind direction

This is a simple tool. It is like a small flag pole with a magnetic compass attached to the base board.

See the addendum at the end of this lesson on how to make a wind tell tail

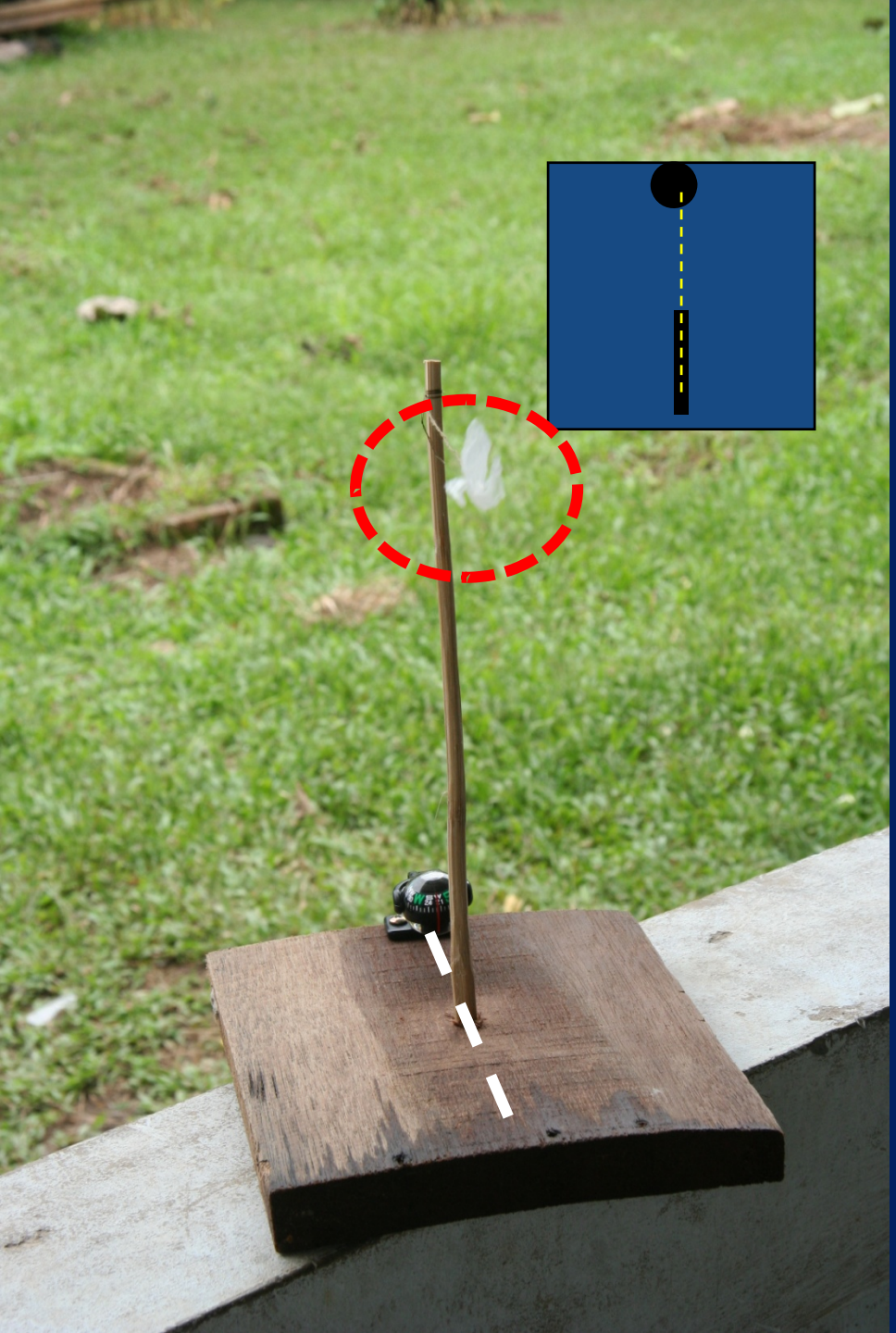


There are 4 steps in using the Wind Tell “Tail” to measure wind direction.

Step 1. Put the Wind Tell “Tail” in an open area where the wind can blow on it.

Step 2.

Step back from the instrument and watch the tell “tail” as the wind blows.



Step 3.

Turn the base board so the compass is in front of the rod AND they make a straight line with the tell “tail”.

Step 4.

Read the compass direction shown at the red indicator line. This is the wind direction.

Remember…

…winds are named for the direction FROM which they come. So this wind is a SE (southeast) wind.

Record the Wind Direction in Section 3.2

3. W	3.2	Steady Wind Direction	Circle direction steady **wind comes FROM**	N NE S SW E SE W NW
		Variable Wind Direction	Circle 1 or more directions **wind comes FROM**	~~N NE S SW~~ ~~E SE W NW~~

It is best if you can make a minimum of 3 observations / day.

The winds should either be “steady” or “variable”. Cross out the section NOT being used. In this example, the winds are “steady”; so cross out the “variable” section.

RTC-TH M.E.W.S. Weather Observation Log

Location

Lat ° ‘ “N Long ° ‘ “E

Lat N Long E Elev m AMSL

Date

Weather Observations Time: Sunrise | Mid-Afternoon | Sunset

Local time 24-hr format Hour→

Observer (initial; see back)

1. Header

2.1	Air (Dry bulb)	Thermometer in shade; 1.5 m above ground	°C	°C	°C
2.2	Wet Bulb		°C	°C	°C
				°C	°C
				%RH	%RH
				°C	°C
			Stress °C	Heat Stress °C
			Chill. °C	Wind Chill. °C

Report wind speed in knots to air crews; km/h to all others.

3.1	Average	Get 3 readings & average	km/h	knts	km/h	knts	km/h	knts
	Gusts	Record highest gust	km/h	knts	km/h	knts	km/h	knts

Wind Speed Guidelines for Helicopter Flight Operations

10 knots / 18.5 km/h ideal; OK to fly — Above 45 knots / 83 km/h; No flights.

3. Wind Speed / Direction

3.2	Steady Wind Direction	Circle direction steady wind comes FROM	N NE S SW E SE W NW	~~N NE S SW~~ ~~E SE W NW~~	N NE S SW E SE W NW
	Variable Wind Direction	Circle 1 or more directions wind comes FROM	N NE S SW E SE W NW	~~N NE S SW~~ ~~E SE W NW~~	N NE S SW E SE W NW

4. Sky Conditions

4.1	Cloud Cover	Use Definitions in Cloud Cover Table	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken
4.2	Cloud Base Ht (Loc Rel)	Relative to local Mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn
	m	m AMSL / Dew Est (1A-1E/10)1000m	m AGL	m AGL	m AGL

Use local mountain of known elevation (above mean sea level) and report clouds above, at, or below mountain top.

Min. flight altitudes: Day – 160m AGL; Night – 500 m AGL; Low cloud ceiling – No flights.

4.3	Cloud Type	High / Middle / Low	Vertically Developed	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat	□CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat	□CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat	□CuNim □ Cumul
4.4	Rainfall	Measure at 0900 hrs each morning. Report amount for last 24 hrs.							mm
4.5	Visual Range (Visibility)	Name of 3.2 km mark		□ more □ less than □ Rain □ Fog □ Haze □ Smoke		□ more □ less than □ Rain □ Fog □ Haze □ Smoke		□ more □ less than □ Rain □ Fog □ Haze □ Smoke	
		Name of 3.2 km mark		□ more □ less than □ Rain □ Fog □ Haze □ Smoke		□ more □ less than □ Rain □ Fog □ Haze □ Smoke		□ more □ less than □ Rain □ Fog □ Haze □ Smoke	

Helicopter minimum visibility: Day – 3.2 km / 2 miles; Night – 5 km / 3 miles; Low visibility – No flights

4.6	Severe Weather	Thunderstorms		□ Yes □ No		□ Yes □ No		□ Yes □ No	
		Lightning	Flash, count secs to boom / 3	N NE E SE S SW W NW □ Yes km		N NE E SE S SW W NW □ Yes km		N NE E SE S SW W NW □ Yes km	

Warn air crews of any severe weather in your area.

Wind Advisory Notes for Helicopters

3. W	3.2	Steady Wind Direction	Circle direction steady wind comes FROM	~~N NE S SW E SE W NW~~
		Variable Wind Direction	Circle 1 or more directions wind comes FROM	N NE S SW E SE W NW

Variable wind directions make flight operations more difficult. Helicopters land by flying into the wind. Each Landing Zone may have approach and departure paths in different directions.

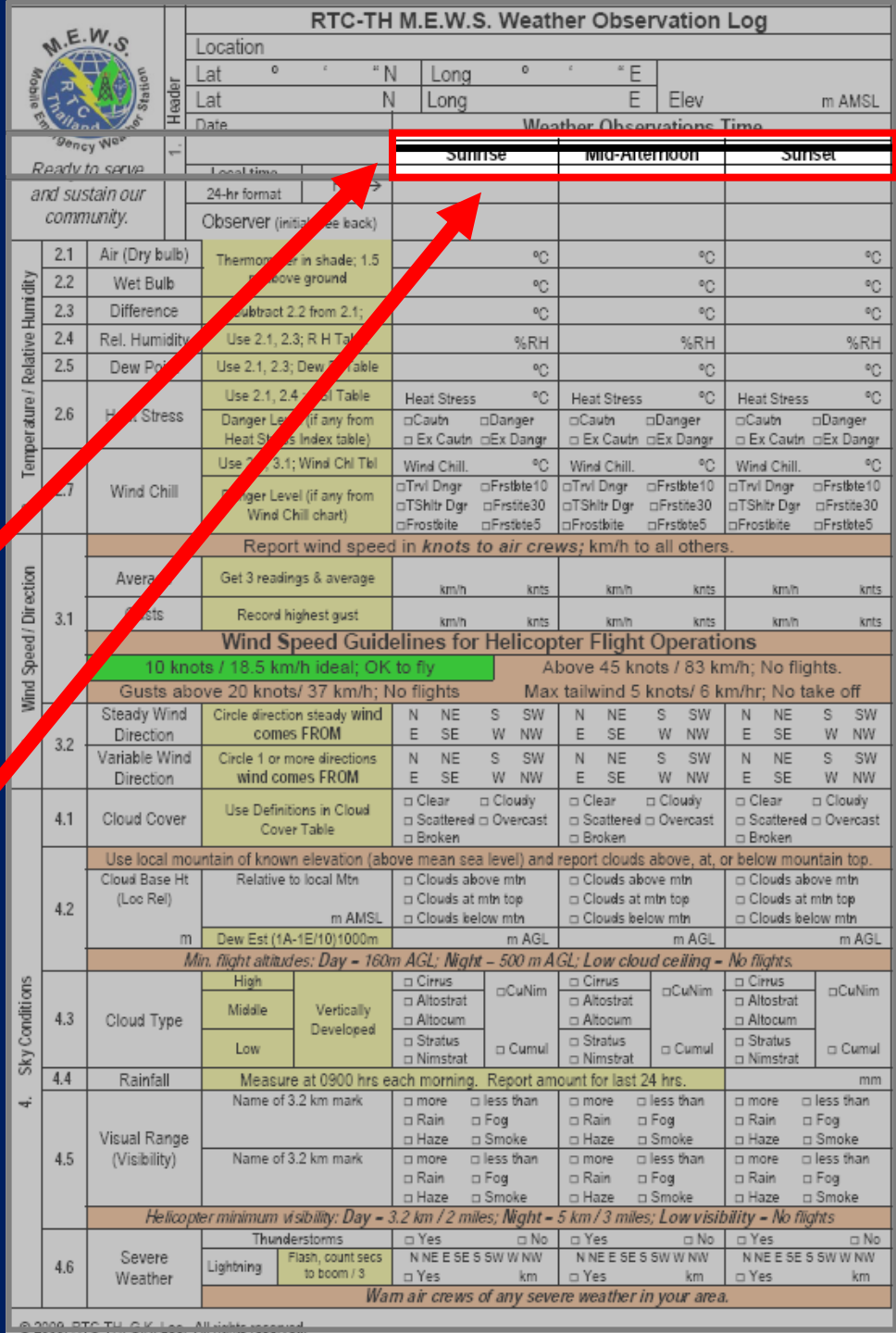
Report a Flight Advisory any time wind conditions are variable at the Landing Zone.

Important Note

Normally MEWS observations are made 3 times a day. However, if flight operations are in progress, try to provide air crews with weather updated prior to landings and take-offs for flight safety.

If more frequent observations are done to support flight operations...

…cross out the headings “Sunrise”, etc. and record the time of the observations in the space provided.



RTC-TH M.E.W.S. Weather Observation Log

Location

Lat ° ‘ “N Long ° ‘ “E

Lat N Long E Elev m AMSL

Date

Weather Observations Time

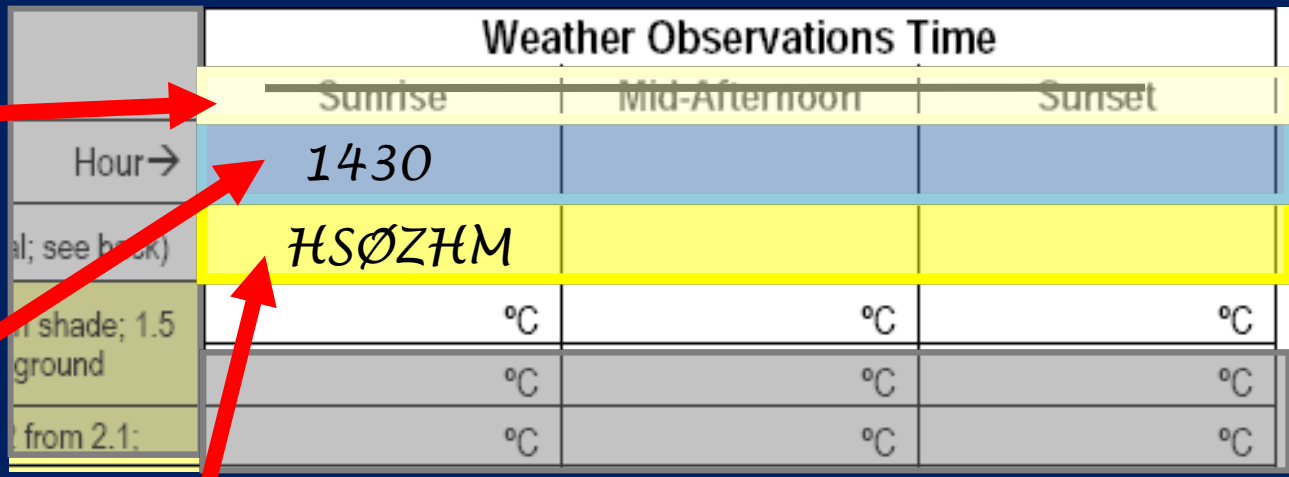
Ready to serve and sustain our community.

			Sunrise	Mid-Afternoon	Sunset
Header	1.	Local time			
		24-hr format			
		Observer (initial… see back)			
Temperature / Relative Humidity	2.1	Air (Dry bulb)	Thermom…er in shade; 1.5 …above ground	°C	°C	°C
	2.2	Wet Bulb		°C	°C	°C
	2.3	Difference	Subtract 2.2 from 2.1;	°C	°C	°C
	2.4	Rel. Humidity	Use 2.1, 2.3; R H Tbl	%RH	%RH	%RH
	2.5	Dew Point	Use 2.1, 2.3; Dew …Table	°C	°C	°C
	2.6	…t Stress	Use 2.1, 2.4 …l Table	Heat Stress °C	Heat Stress °C	Heat Stress °C
			Danger Le… (if any from Heat St…s Index table)	□Cautn □Danger □ Ex Cautn □Ex Dangr	□Cautn □Danger □ Ex Cautn □Ex Dangr	□Cautn □Danger □ Ex Cautn □Ex Dangr
	2.7	Wind Chill	Use …3.1; Wind Chl Tbl	Wind Chill. °C	Wind Chill. °C	Wind Chill. °C
			…ger Level (if any from Wind Chill chart)	□Trvl Dngr □Frstbite10 □TShltr Dgr □Frstite30 □Frostbite □Frstite5	□Trvl Dngr □Frstbite10 □TShltr Dgr □Frstite30 □Frostbite □Frstite5	□Trvl Dngr □Frstbite10 □TShltr Dgr □Frstite30 □Frostbite □Frstite5
Wind Speed / Direction			Report wind speed in *knots to air crews;* km/h to all others.			
	3.1	Avera…	Get 3 readings & average	km/h knts	km/h knts	km/h knts
		…sts	Record highest gust	km/h knts	km/h knts	km/h knts
			Wind Speed Guidelines for Helicopter Flight Operations			
			10 knots / 18.5 km/h ideal; OK to fly	Above 45 knots / 83 km/h; No flights.		
			Gusts above 20 knots/ 37 km/h; No flights	Max tailwind 5 knots/ 6 km/hr; No take off		
	3.2	Steady Wind Direction	Circle direction steady wind comes FROM	N NE S SW E SE W NW	N NE S SW E SE W NW	N NE S SW E SE W NW
		Variable Wind Direction	Circle 1 or more directions wind comes FROM	N NE S SW E SE W NW	N NE S SW E SE W NW	N NE S SW E SE W NW
4. Sky Conditions	4.1	Cloud Cover	Use Definitions in Cloud Cover Table	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken	□ Clear □ Cloudy □ Scattered □ Overcast □ Broken
	4.2		Use local mountain of known elevation (above mean sea level) and report clouds above, at, or below mountain top.			
		Cloud Base Ht (Loc Rel)	Relative to local Mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn	□ Clouds above mtn □ Clouds at mtn top □ Clouds below mtn
		m	m AMSL / Dew Est (1A-1E/10)1000m	m AGL	m AGL	m AGL
			Min. flight altitudes: Day – 160m AGL; Night – 500 m AGL; Low cloud ceiling – No flights.			
	4.3	Cloud Type	High / Middle / Low — Vertically Developed	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat / □CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat / □CuNim □ Cumul	□ Cirrus □ Altostrat □ Altocum □ Stratus □ Nimstrat / □CuNim □ Cumul
	4.4	Rainfall	Measure at 0900 hrs each morning. Report amount for last 24 hrs.			mm
	4.5	Visual Range (Visibility)	Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke
			Name of 3.2 km mark	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke	□ more □ less than □ Rain □ Fog □ Haze □ Smoke
			Helicopter minimum visibility: Day – 3.2 km / 2 miles; Night – 5 km / 3 miles; Low visibility – No flights			
	4.6	Severe Weather	Thunderstorms	□ Yes □ No	□ Yes □ No	□ Yes □ No
			Lightning / Flash, count secs to boom / 3	N NE E SE S SW W NW □ Yes km	N NE E SE S SW W NW □ Yes km	N NE E SE S SW W NW □ Yes km
			Warn air crews of any severe weather in your area.			

For flight operations, make and report observations to flight crews before landings and take-offs

Cross out the headings for Sunrise, Mid-Afternoon, Sunset

Record the specific local time of your observations

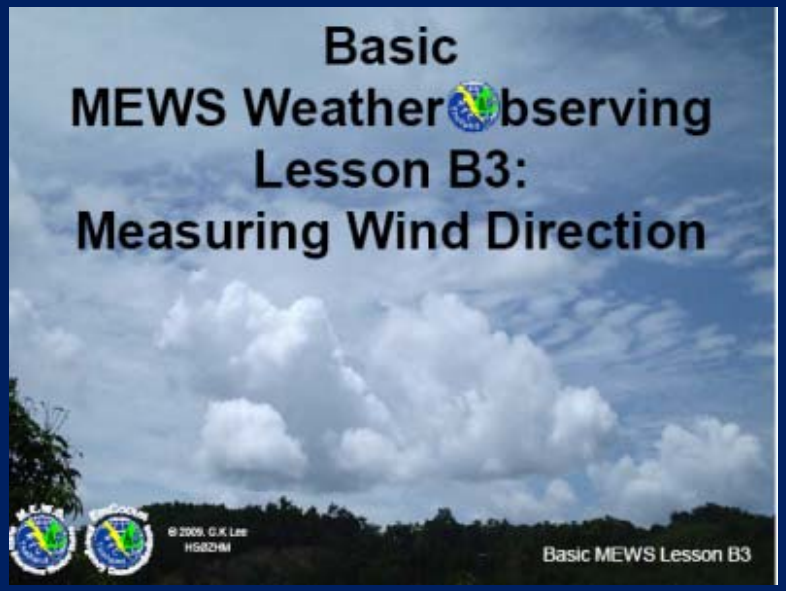


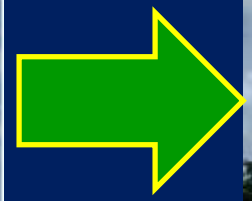
If a HAM, print your call sign (or name if no call sign)

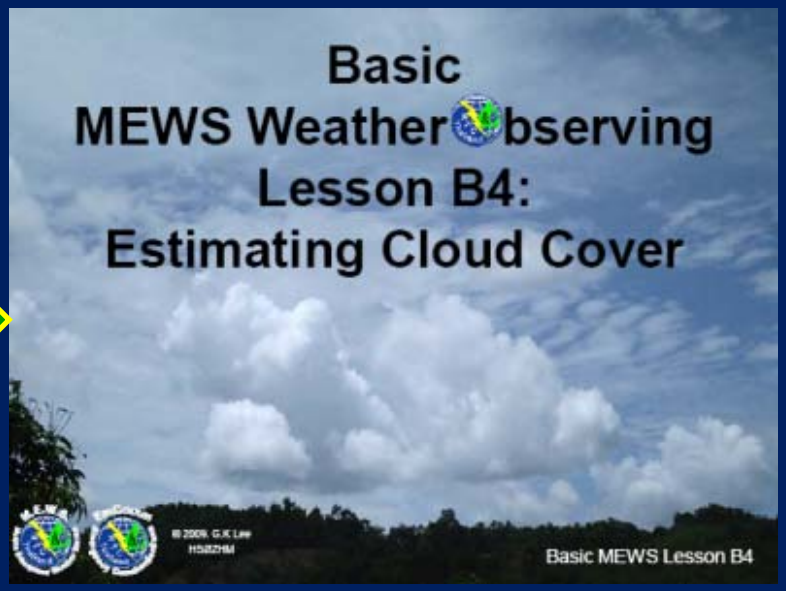
Record the wind direction in Section 3.2

Weather observations to support flight operations are critical for safety of flight crew and LZ area.

Now you know how to make a Basic Wind Direction Measurement





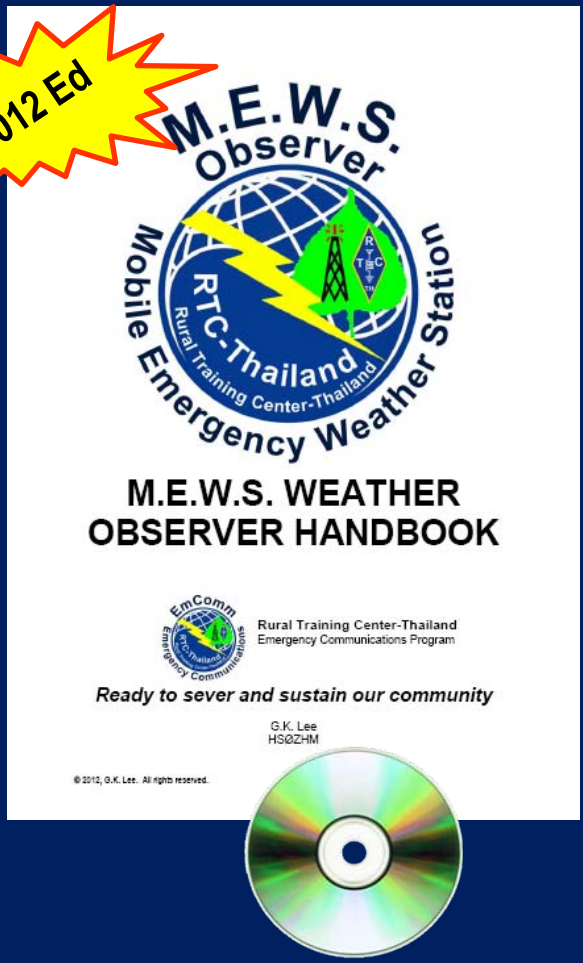


You are now ready for Basic MEWS Lesson B4: Estimating Cloud Cover

Free Self-Study Materials by Internet

- RTC-TH Weather Observer manual
- Illustrated PDF topical lessons

2012 Ed



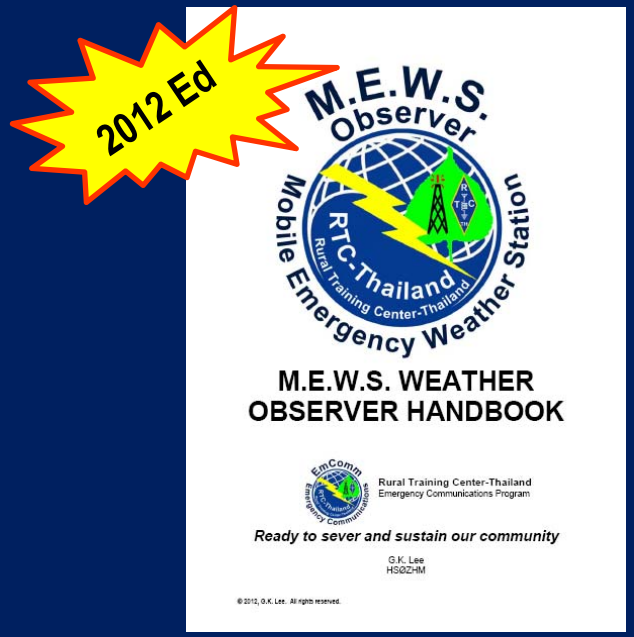
All of the lessons have been classroom and field proven.

Send e-mail to hsØzhm@gmail.com to request free training materials for non-commercial use only.

These materials are in English. Volunteer assistance for Thai translation to is welcome and will be acknowledged and cited.

Questions or Comments

Refer to the MEWS Weather Observer Handbook for more details on any of the procedures in this lesson.



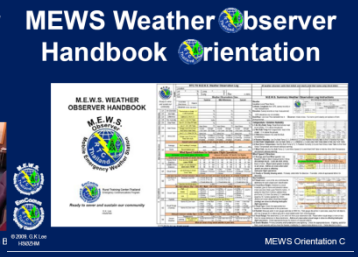
You may also contact us by e-mail:
hsØzhm@gmail.com
We are always trying to improve our lessons. Your comments and suggestions are welcomed.

Basic MEWS PDF Lessons

B 1: Measuring Temperature
B 2: Estimating wind speed
B 3: Measuring Wind Direction
B 4: Estimating Cloud Cover
B 5: Estimating Cloud Base Height
B 6: Identifying Cloud Types
B 7: Estimating Visual Range
B 8: Severe Weather Conditions

Be sure to check www.neighborhoodlink.com/RTC-TH_Tech/pages for the latest updated editions of MEWS lessons

Basic MEWS PDF Lessons



2012 Ed

3 Orientation and 8 Basic lessons.
Some show how to build your own weather equipment.

Advanced MEWS PDF Lessons

A 1: Measuring Relative Humidity and Heat Stress

A 2: Measuring Wind Speed and Wind Chill

A 3: Using Dew Point Temperature to Calculate Cloud Base Height

A 4: Measuring Rainfall

A 5: Reporting Severe Weather

A 6: Weather Forecasting

Be sure to check www.neighborhoodlink.com/RTC-TH_Tech/pages for the latest updated editions of MEWS lessons

Advanced MEWS PDF Lessons

Six slide show lessons
Some show how to build your own weather equipment

For More Information about M.E.W.S.

Contact
Greg, HSØZHM
MEWS Creator / Mentor

Via E-mail / video chat
hsØzhm@gmail.com

Via Skype video
conference call: rtc_th

Photo from the Internet; educational fair use clause

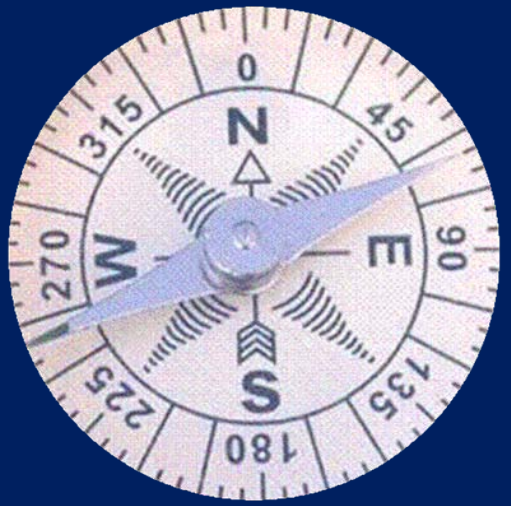
Wouldn't it be unbearable to find yourself out on a limb without an EmComm Plan?

Community-based Environmental Education for

The End

Continue to see the Addenda on measuring wind direction by azimuth, magnetic declination and how you can make your own wind tell-tail to more accurately measure wind direction.

Wind Direction by Azimuth Number



Photos from the Internet; educational fair use clause

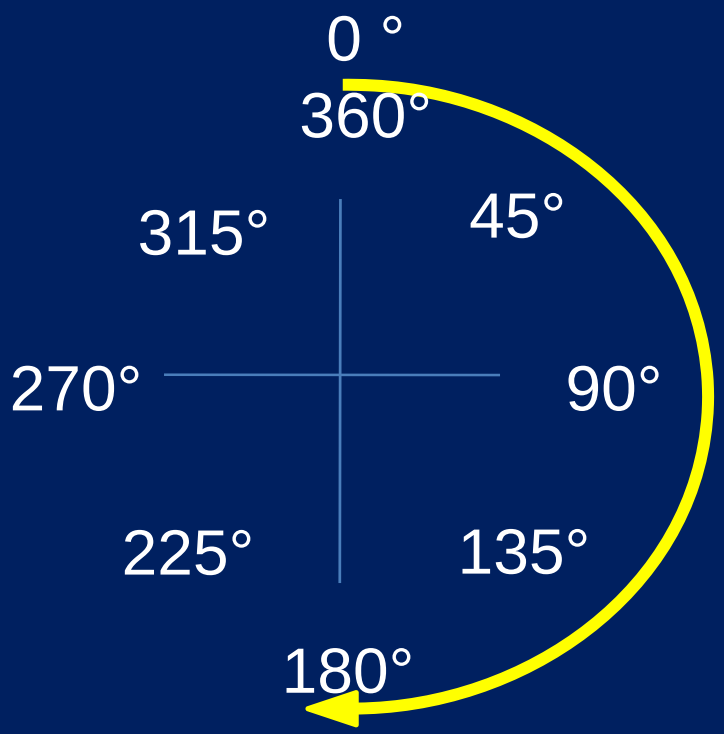
Don’t spend too get an exact azimuth number

Most commonly available compasses are only accurate to +/- 2 or 5 degrees. General direction names are suitable for air crew information needs.

Measuring Azimuths

Directional azimuth numbers use the 360° in a circle. Numbering starts at North with “0°” and goes clockwise ending at North with “360°”.

Just be sure you face directly into the wind.



0° or 360° = N
45° = NE
90° = E
135° = SE
180° = S
225° = SW
270° = W
315° = NW

See warnings on next slide

What's in a number?

Implied Accuracy, but…

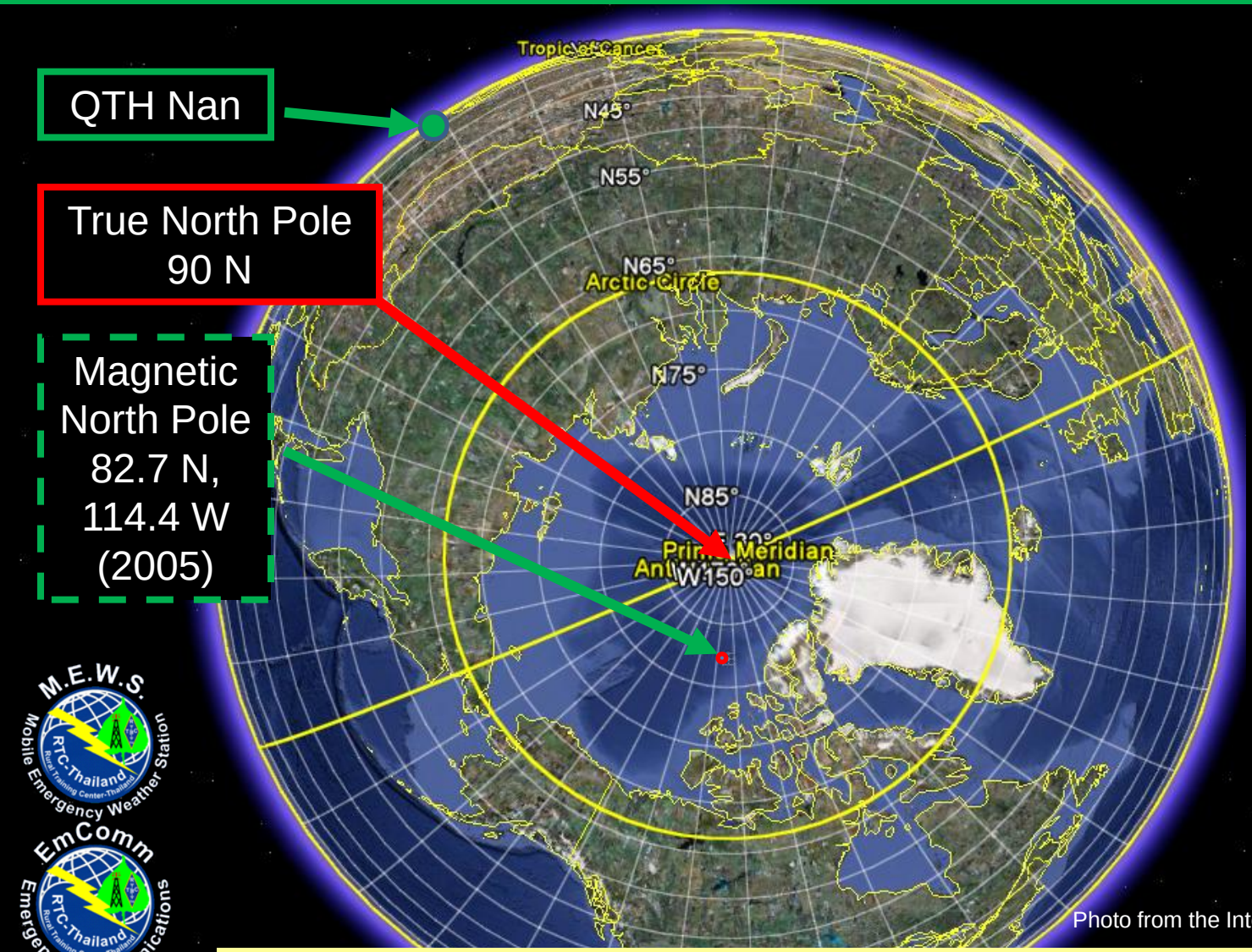
--the azimuth number is reported, but the instrument error is not.

--there may be a possible error in magnetic declination correction (if any correction was done)

--the possible confusion in reporting a "bearing" vs. an "azimuth"

To be clear: Report all azimuths or compass directions as MAGNETIC so it is clear they are not referenced to Truth geographic North.

Magnetic Declination

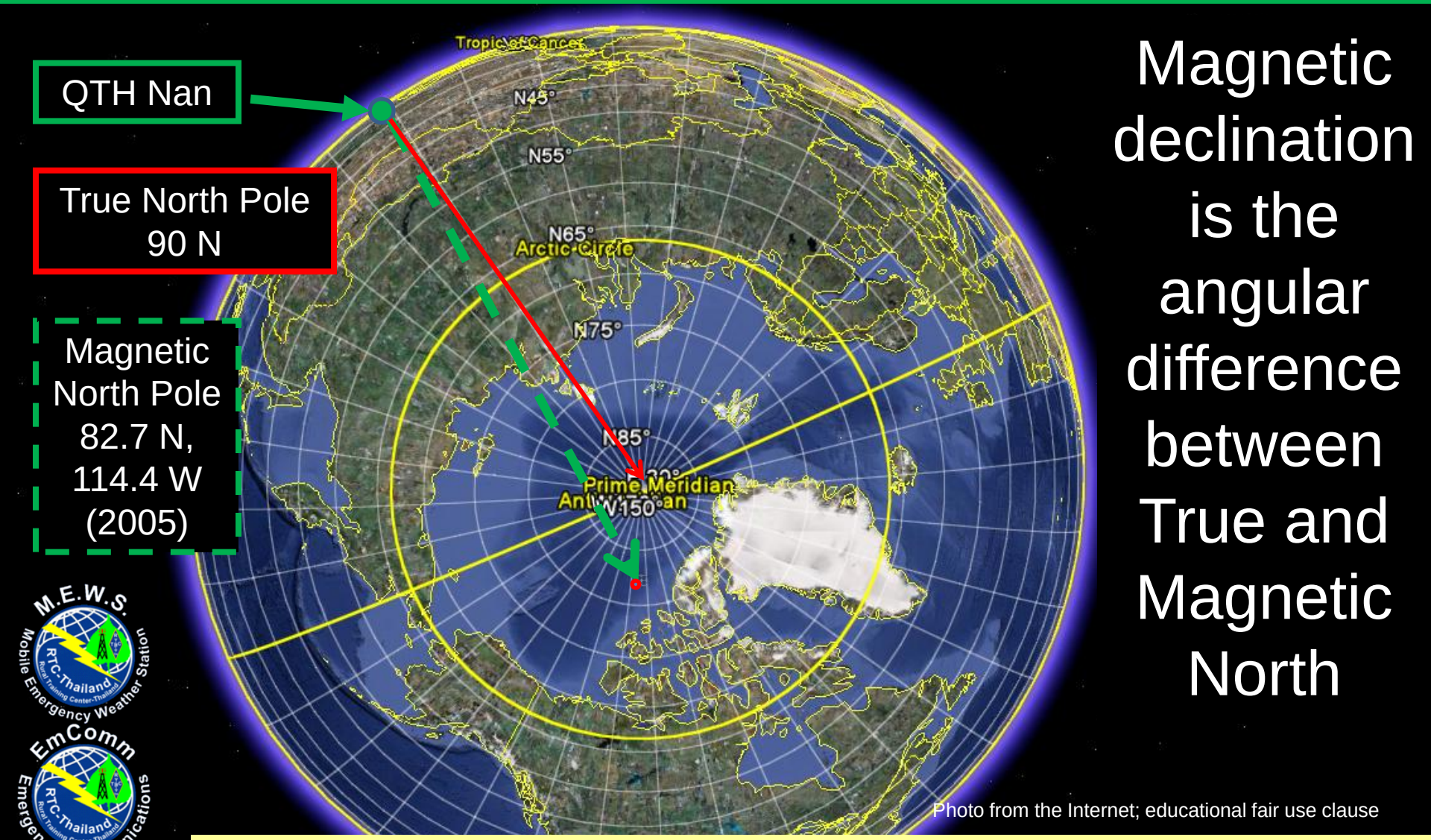


Magnetic declination exists because the True North Pole and Magnetic North are not in the same place

Photo from the Internet; educational fair use clause

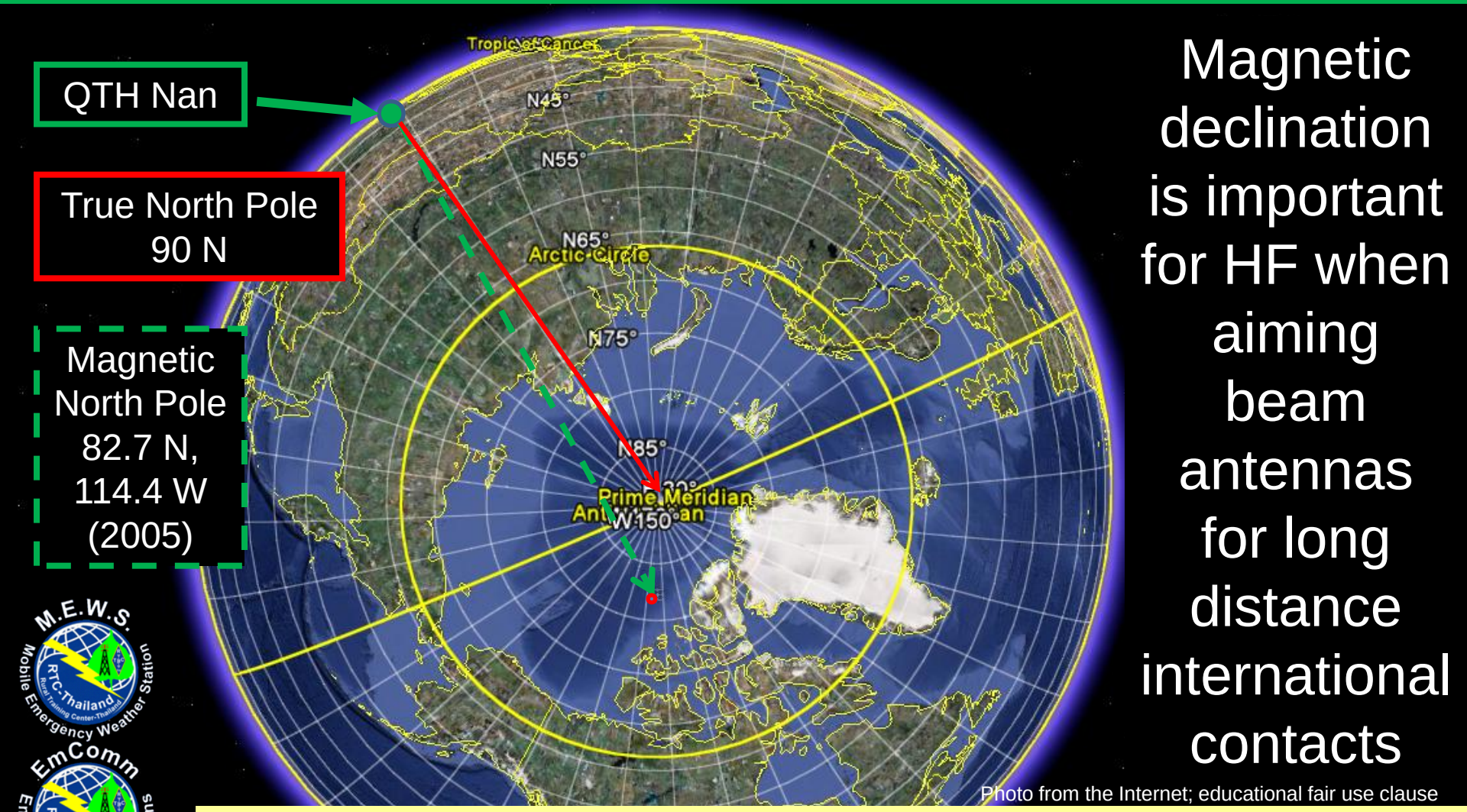
In simple terms, a magnetic compass points toward the magnetic north pole.

Magnetic Declination



In simple terms, a magnetic compass points toward the magnetic north pole.

Magnetic Declination and HAM radio



Magnetic declination is important for HF when aiming beam antennas for long distance international contacts

Photo from the Internet; educational fair use clause

DX signals are not dealt with in MEWS lessons but www.njdxa.org/dx-tools/beam-headings.php is an online calculator for distance and azimuth

Magnetic Declination

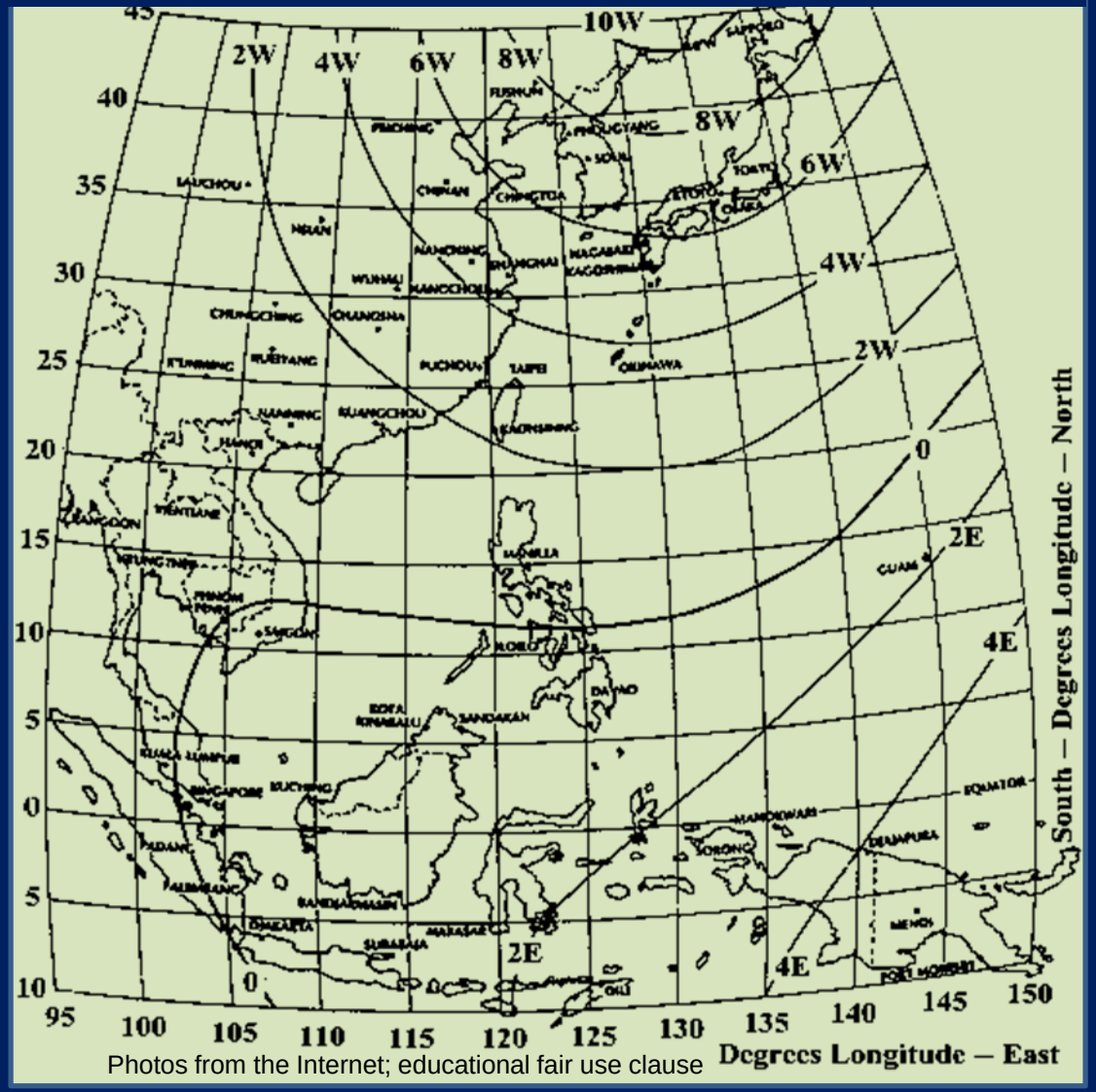
Across Thailand, from west to east, the magnetic declination is about +/- 1 degree and a few minutes E or W.

Most common magnetic compasses cannot measure less than 2-5 degrees.

The magnetic field force lines are not straight lines on an isogonic map.

For MEWS, report only ***magnetic*** azimuths.
Do not correct for declination!

Regional Isogonic Map



Photos from the Internet; educational fair use clause

Magnetic Declination for Nan

Nan Muang = 1° 1’ West
Thawangpha = 1° 2’ West

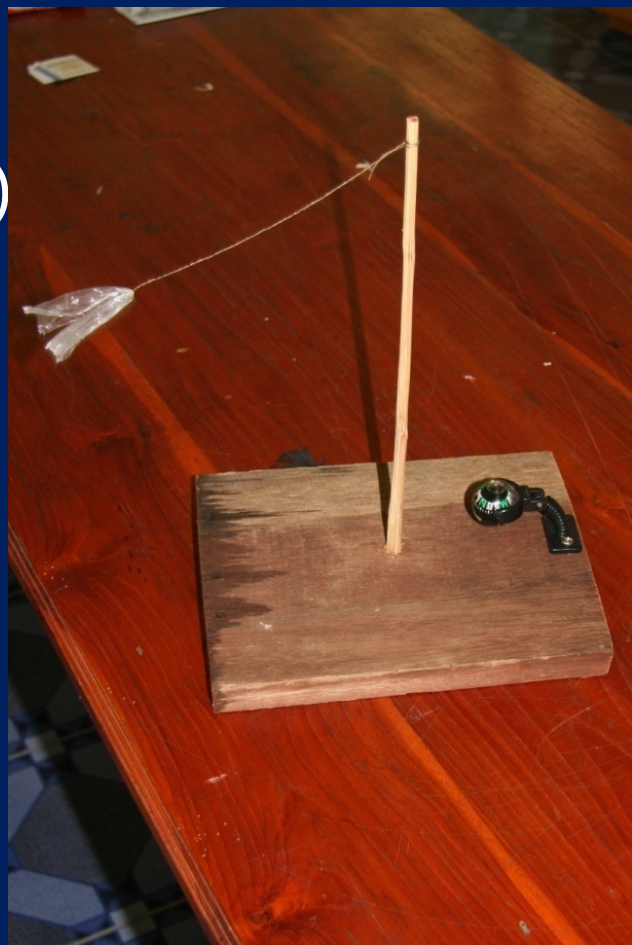
This is well within the +/- 2° or 5° error of most magnetic compasses. For MEWS reporting, no correction for magnetic declination is necessary.

For clarity, report all azimuths or compass directions as MAGNETIC so it is clear they are not referenced to Truth geographic North.

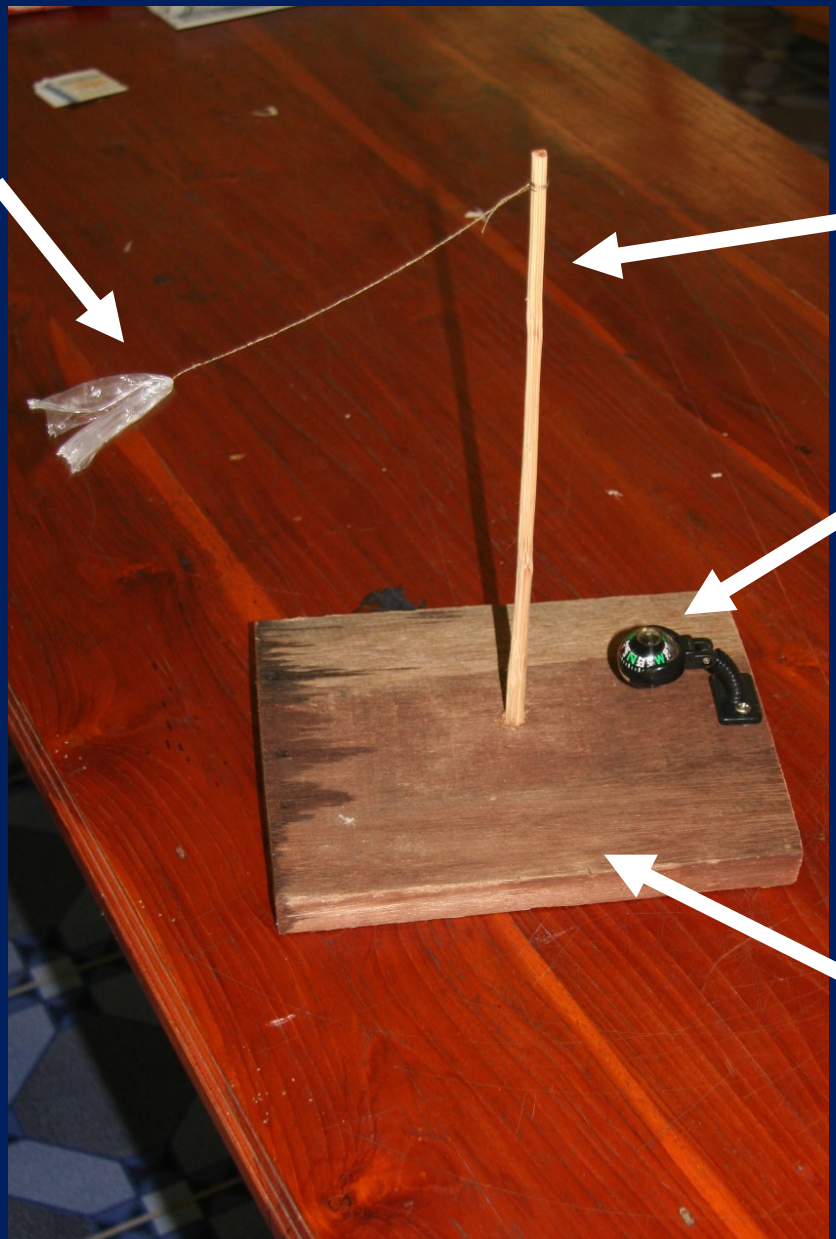
You Can Make A Wind "Tell-tail" to Measure Wind Direction

Materials and tools you need:

- Wood board (~15 cm x 15 cm)
- Bamboo stick (~15-30 cm)
- Some thread
- A piece of plastic bag
- A magnetic compass
- A drill
- Some screws
- A screw driver



The Parts of a Wind Tell “Tail”



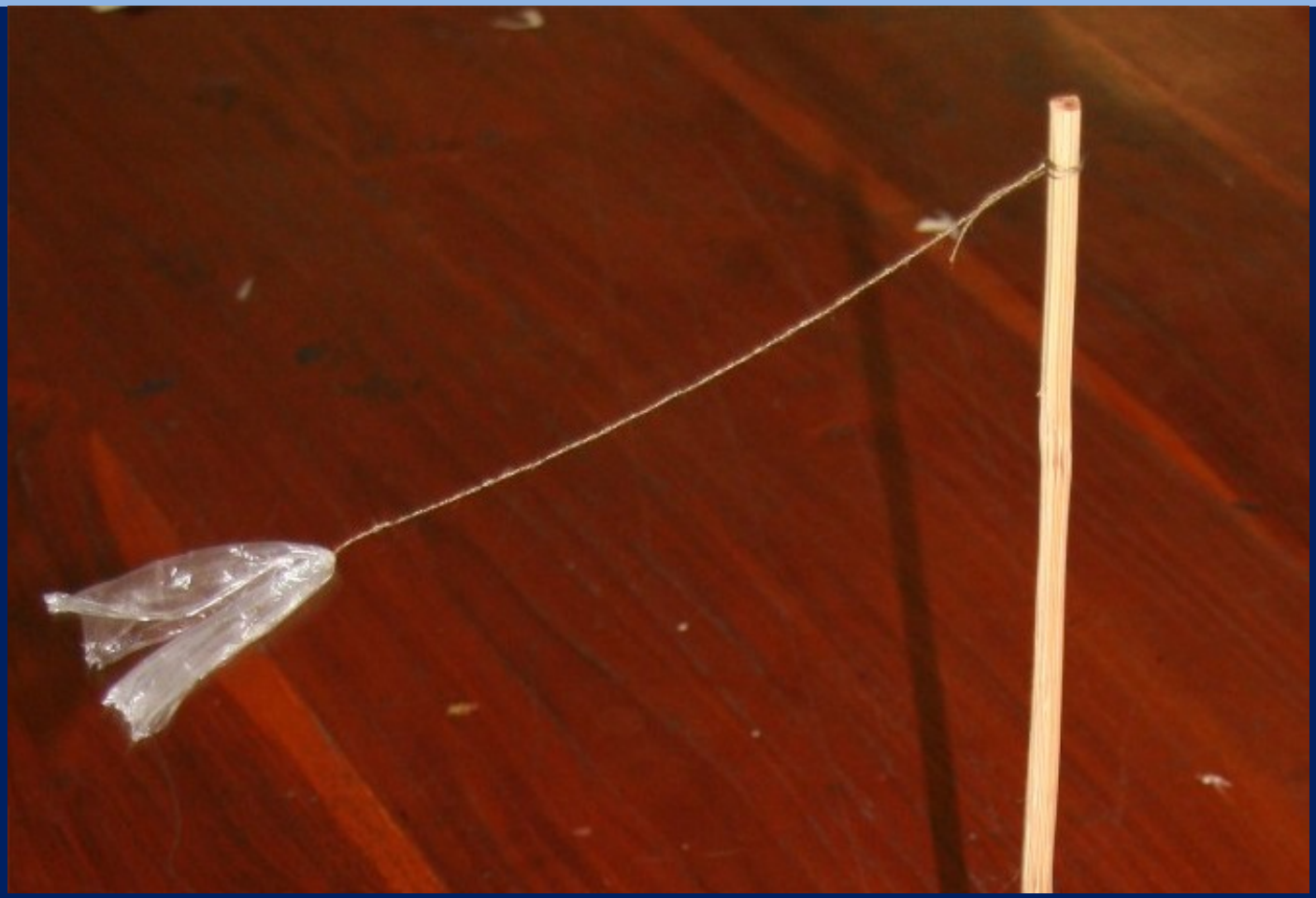
Basic Assembly

A rod is put in the middle of the base board.

Basic Assembly

A compass is place in line with the rod.

Basic Assembly



To make the tell “tail” tie a piece of plastic bag to the rod with a thread.

Community-based Environmental Education for

The End

You may now go to Basic MEWS Lesson
B4: Estimating Cloud Cover