

NAVIGATION TRAINING

ESSENTIAL MAP AND COMPASS
SKILLS IN PREPARING FOR
AN ADVENTUROUS JOURNEY

VERSION 2018.01.13



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TYPES OF MAPS



POLITICAL MAP

- Shows political units (countries, states, provinces, cities, etc)
- Different colours show man-made divisions of land

POLITICAL MAP EXAMPLES

- World map
- Country map
- City map
- Parish map

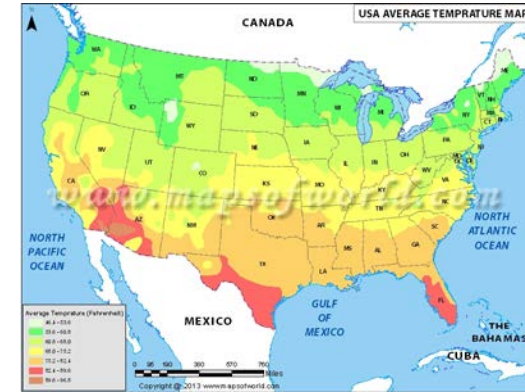


PHYSICAL MAP

- Shows land elevations and physical features – mountains, valleys, deserts
- Different colours show land elevations

PHYSICAL MAP EXAMPLES

- Topographic map – Earth's surface
- Relief map – show elevation and terrain, uses shading
- Contour map – show elevation and terrain, & lines that join equal elevations



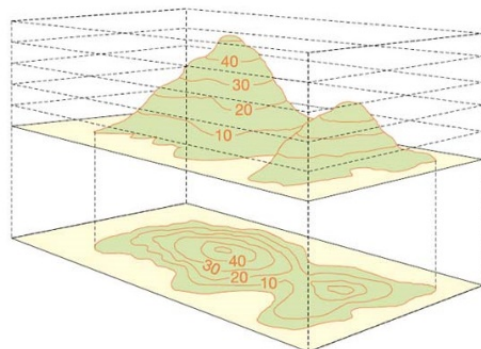
THEMATIC MAP

- Emphasize a particular theme or topic about an area
- This map represents average temp

THEMATIC MAP EXAMPLES

- Weather maps
- Population maps
- Natural resources maps
- Road maps
- Economic activity maps Land usage maps

Within each type of map, there are hundreds of maps that can be produced.

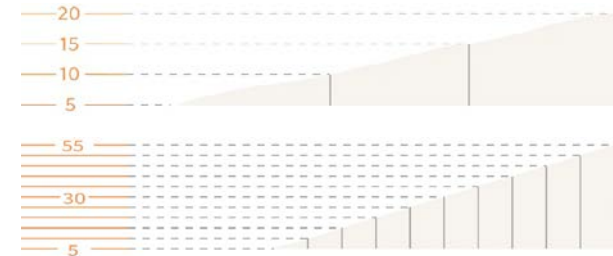


Contour Lines

- Line on a map joining points of equal height above or below sea level

Gradient (Slope)

- The measure of steepness or the degree of inclination



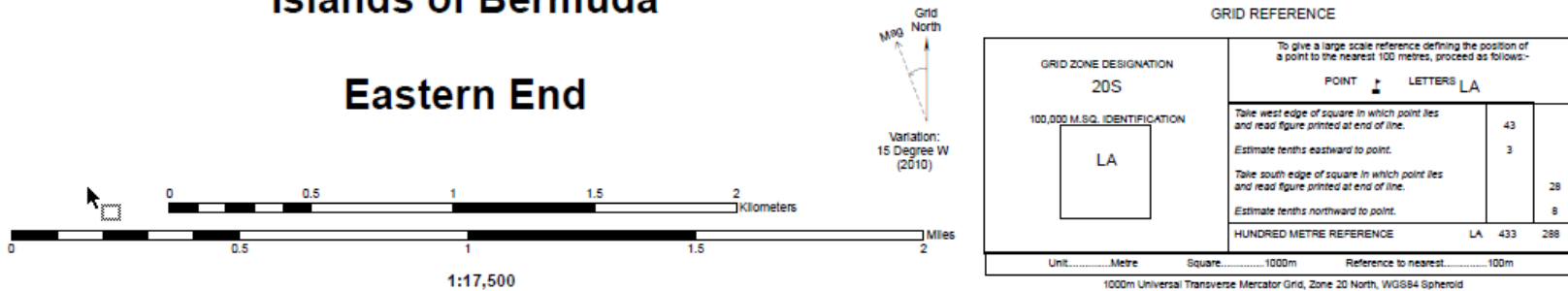
MAP LEGEND

A **map legend** is included with a map to unlock it. It gives you the information needed for the map to make sense. Maps often use symbols or colors to represent things, and the map key explains what they mean.

A **map scale** shows the relationship between the distance on the ground and the corresponding distance on a specific map. On a map with a scale 1:100000, 1 cm would equal 1 km. With our Award maps being 1:17,500, 1 cm equals 5.7 km. Maps with a smaller ratio contain more information like roads, rivers, etc than maps with larger ratios.

Islands of Bermuda

Eastern End



Series Bda 511
 Bermuda Orienteer Map
 Edition 1 - Bda 2016

© Bermuda Government 2016

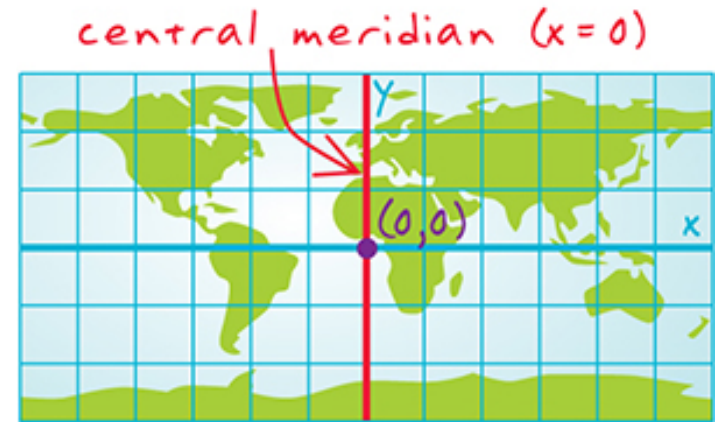
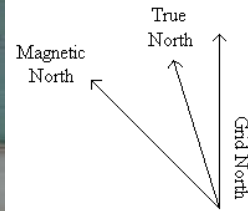
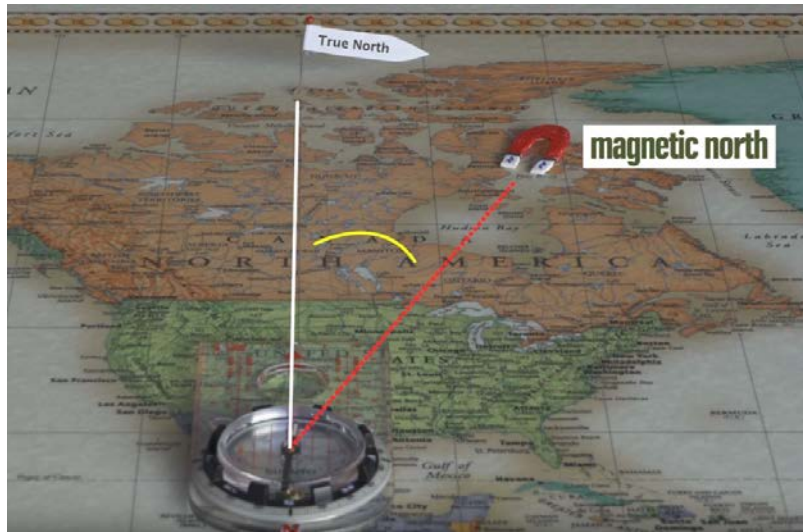


Legend

Historic Sites	AIRPORT	ESSO	QUARRY	Tribe Road	Amenity Park	City of Hamilton	Smiths
Fuel Stations	ATC	FIRE	REGIMENT	Residential	Nature Reserve	Devonshire	Southampton
Church	BDA RADIO	GOVERNMENT HOUSE	RUBIS	Railway Trail	Recreational Park	Hamilton	StGeorge's
School	BELCO	HOSPITAL	WEATHER	City	Golf Course	Paget	Town of St George
Tower	BTC	LINK BDA		Secondary	Water	Pembroke	Warwick
Accommodation		POLICE		Primary		Sandys	

Sheet History
 Edition 1 prepared by the Ministry of Public Works, Survey Section from the 2012 Topographic Map Database, obtained from the 2012 Aerial photography.

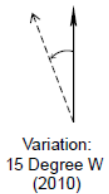
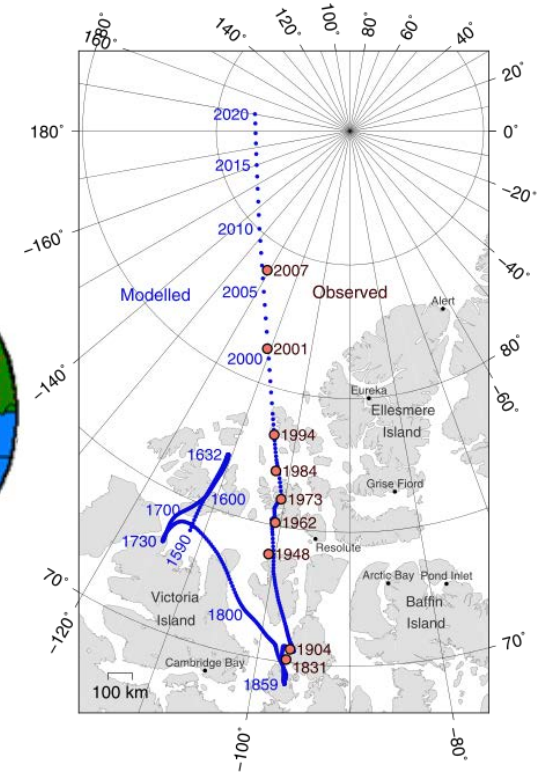
DIFFERENT TYPES OF NORTH



Grid North - The upward direction along the vertical gridlines on a map.

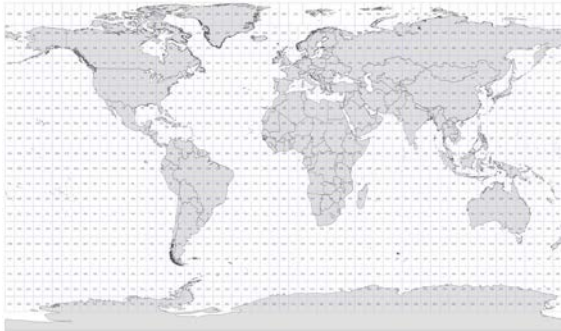
True North - The direction along the earth's surface towards the geographic North Pole.

Magnetic North - A compass needle points to the magnetic north pole. The magnetic north pole is currently located in the Baffin Island region of Canada.



- The horizontal angular difference between True North and Magnetic North is **MAGNETIC VARIATION** or **DECLINATION**.
- The **declination** currently in Bermuda is 15° west of true North.
- The magnetic pole seems to be moving northward at an average rate of 10 kilometers per year.
- This is about 1 degrees every three years.

GRID REFERENCES

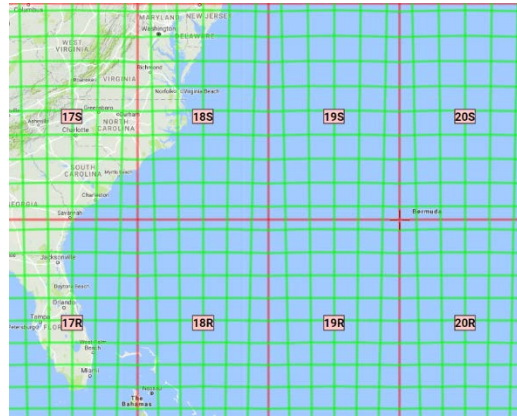


The whole world is mapped out in grids. The reason for grid references is that it allows you to find any location in the world. An example would be **20S LA 3196 7423**.

There are 3 parts to the address:

- **Grid Zone Designation** – A worldwide unique address represented by a number and single letter. Example: **20S**
- **Square Identifier** – A 100km square in the grid zone represented by 2 letters. Example: **LA**
- **Grid Coordinates** – Represented by 2-10 digits depending on how precise you need to be.
 - 2-digit = precision within 10km
 - 4-digit = precision within 1km
 - 6-digit = precision within 100m
 - 8-digit = precision within 10m
 - 10-digit = precision within 1m

The Award only focused on the 4-8 digit grid references for route cards.

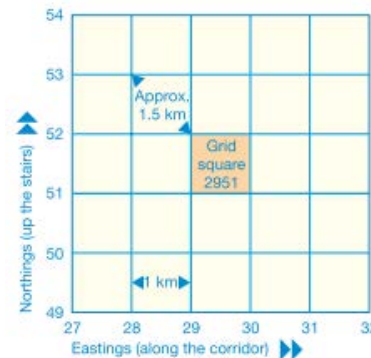


Grid Zone Designation

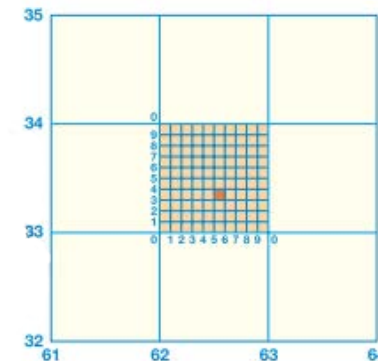


Square Identifier

Four-digit Grid Reference - Is how the **bronze** groups identify a square on a map. Finding grid references are easy if you can remember that you always “**Go along the corridor and up the stairs**”. The example below is a grid reference of 29 51.

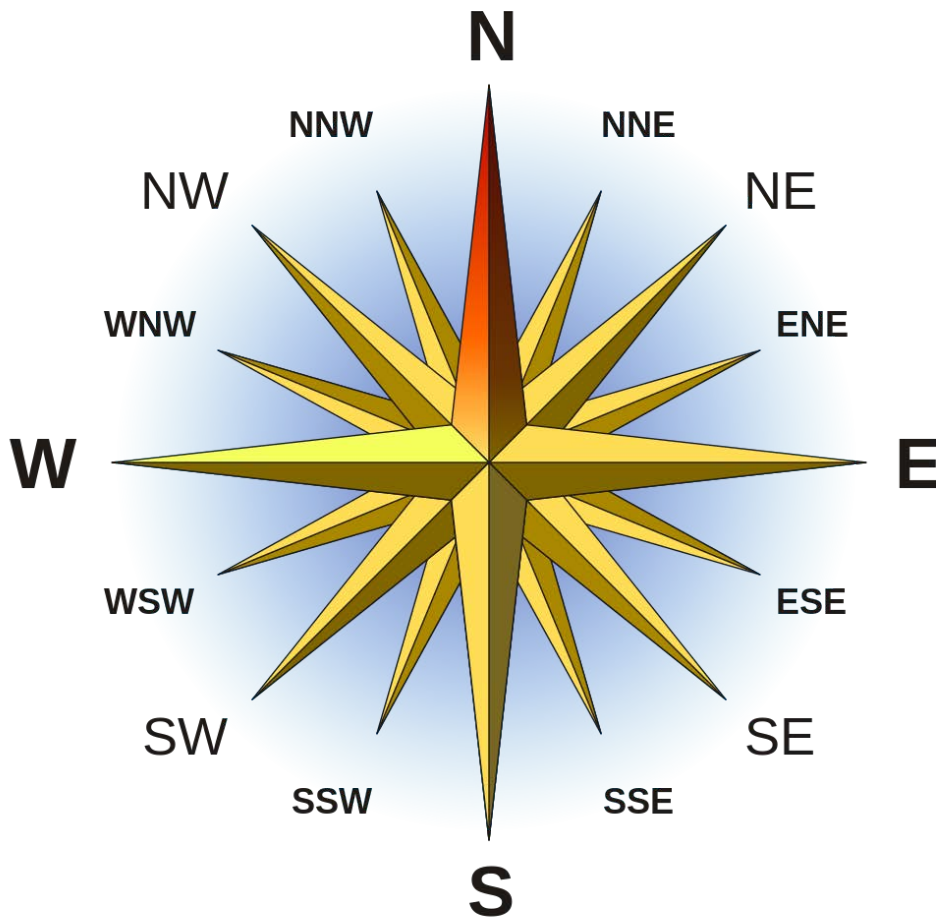


Six-digit Grid Reference - The **silver** groups use a six-digit grid reference to pinpoint a location on the map. The example below is a grid reference of 625 333. **Gold** uses an **eight-digit grid reference**.



COMPASS ROSE

Displays the orientation of the cardinal directions and their intermediate points.



POINTS	DIRECTION	TOTAL	LEVEL
Cardinal	N, E, S, W	4	Bronze
Intercardinal	NE, SE, SW, NW	8	Silver
Secondary-Intercardinal	NNE, ENE, ESE, SSE, SSW, WSW, WNW, NNW	16	Gold

POINTS OF THE COMPASS



An intercardinal direction is one of the four intermediate compass directions located halfway between the cardinal directions.

Northeast (NE), 45°, halfway between north and east, is the opposite of southwest.

Southeast (SE), 135°, halfway between south and east, is the opposite of northwest.

Southwest (SW), 225°, halfway between south and west, is the opposite of northeast.

Northwest (NW), 315°, halfway between north and west, is the opposite of southeast.

The directional names are also routinely and very conveniently associated with the degrees of rotation in the unit circle.

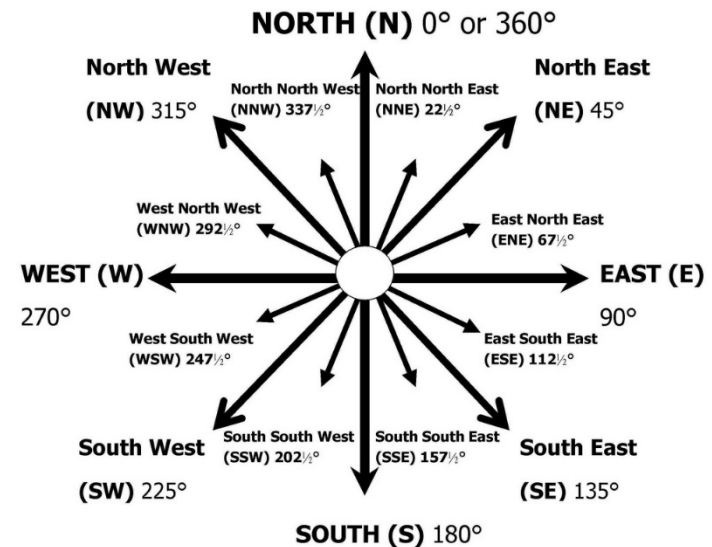
The four cardinal directions correspond to the following degrees of a compass:

North (N): 0° = 360°

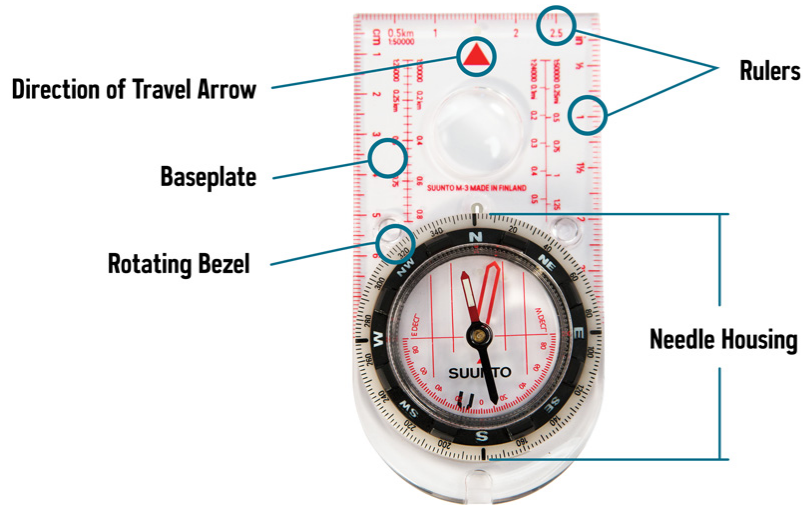
East (E): 90°

South (S): 180°

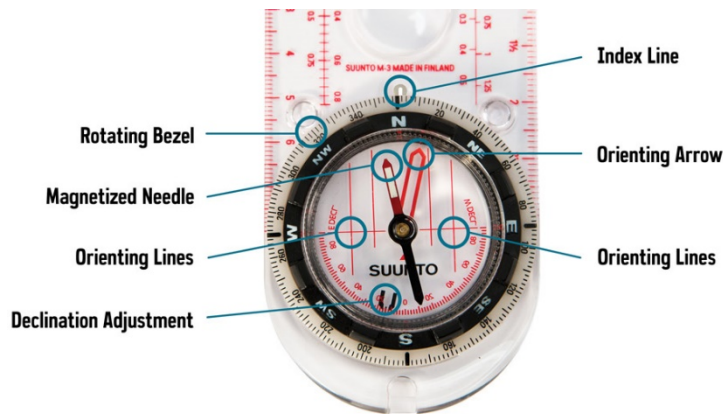
West (W): 270°



PARTS OF A COMPASS



COMPASS ANATOMY



NEEDLE HOUSING DETAIL

Baseplate: Clear, so you can see the map below it, it has at least one straight edge for taking bearings and transferring them to your map.

Ruler(s): Used with your map's scale to determine distances.

Direction-of-travel arrow: Tells you which direction to point the compass when you are taking or following a bearing.

Rotating bezel: Also called the "azimuth ring," this outer circle has 360-degree markings.

Index line: Located directly above the bezel, it is also called a "read bearing here" mark.

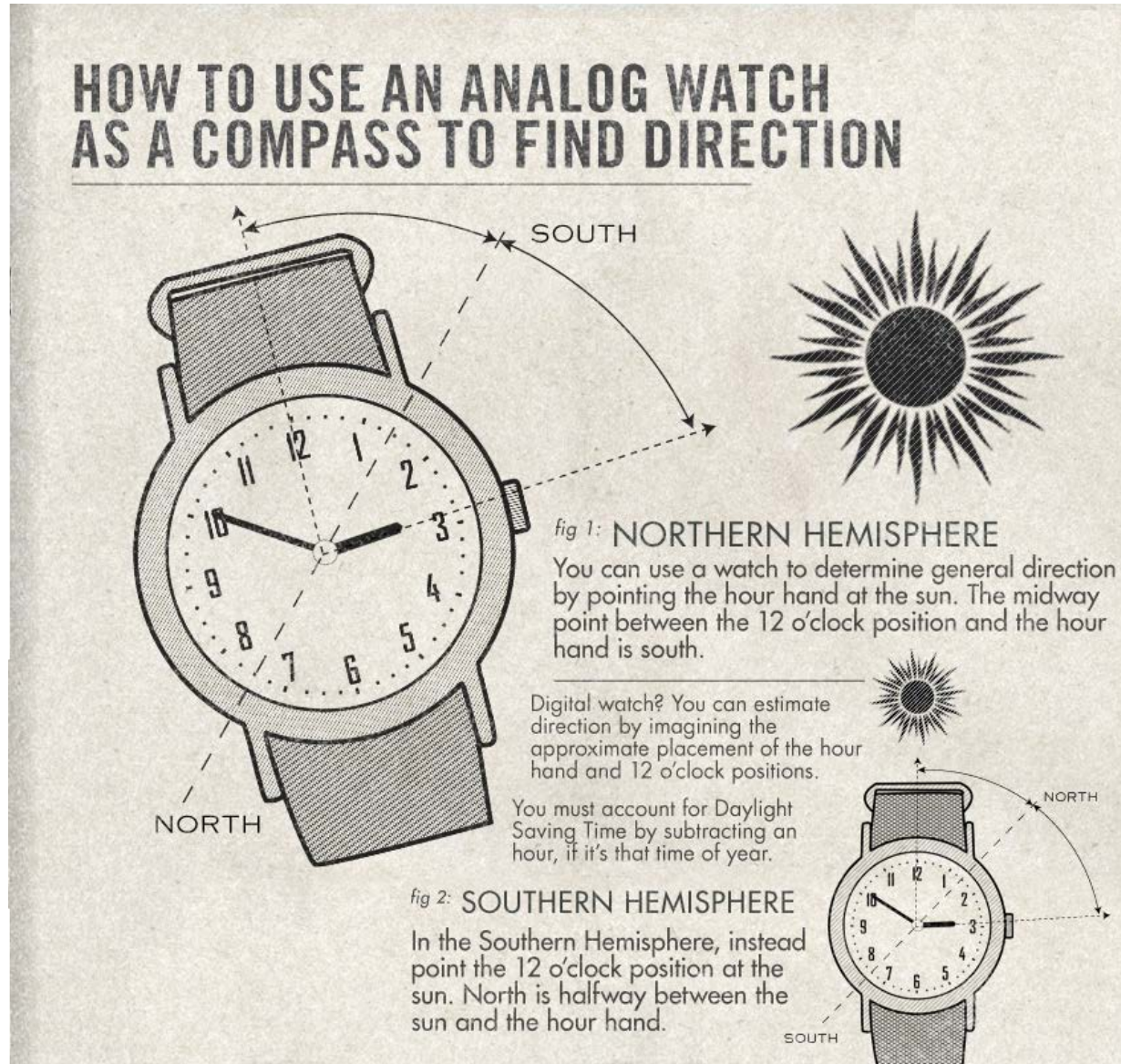
Magnetized needle: The end that always points to the magnetic pole is usually colored red or white.

Orienting arrow: Used to orient the bezel, it has an outline shaped to exactly fit the magnetized end of the needle (**Red in the Shed**).

Orienting lines: Parallel lines that rotate with the bezel; correctly aligning these with the north-south lines on a map aligns your orienting arrow with north.

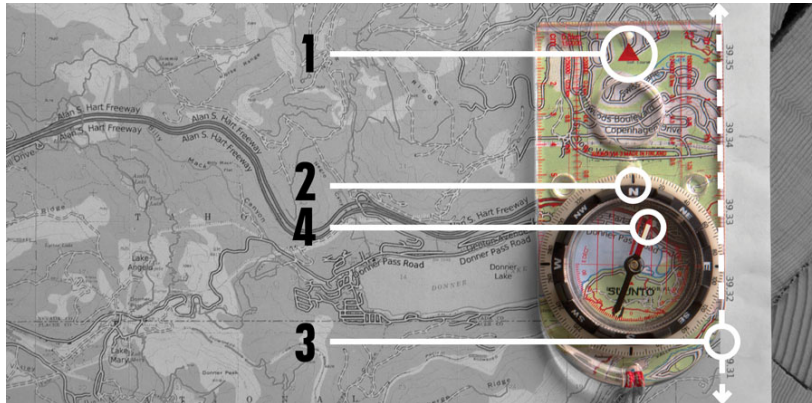
USE YOUR WATCH AS COMPASS

If you are ever lost and need to figure out a general direction but you are without a compass, use this handy trick with an analog watch.



USING YOUR COMPASS

Orienting Your Map



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 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. (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 (**Red in the Shed**).

Compass Bearings



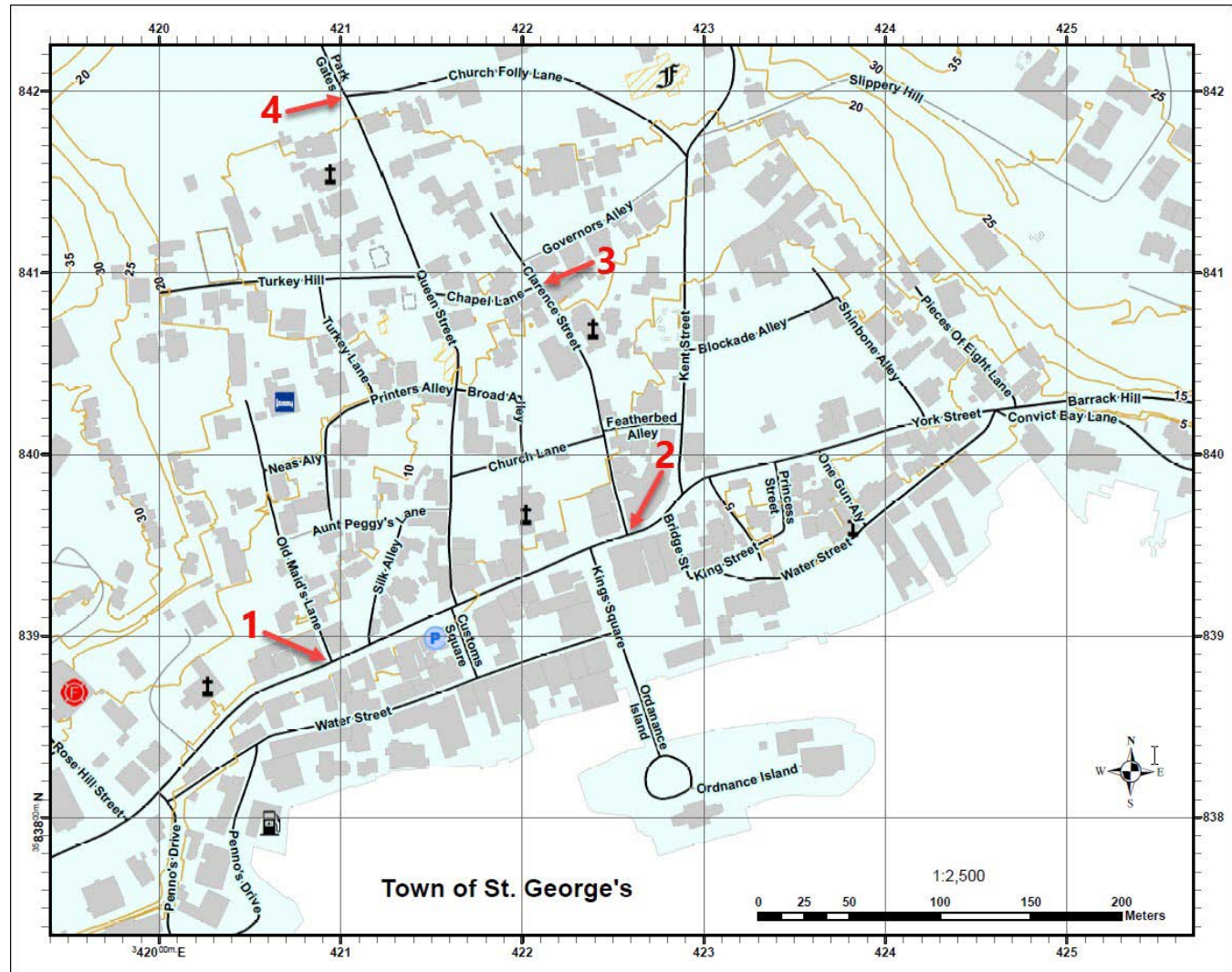
A “**bearing**” is simply a navigationally precise way to describe a direction. For example, instead of heading “northwest” to get to a campsite, you might follow a bearing of 315 degrees.

1. Set your compass on the map so that the straight side of the baseplate lines up between your current position (1a) and the map location for a destination like a campsite (1b).
2. Make sure the direction of travel arrow is pointing in the general direction of the location you want to go.
3. 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 have just captured.

PRACTICE 1 – NAVIGATION

Use as page a reference when using your compass.

Download and print the **Practice 1 - Navigation** 11x17 file to practice your navigation skills.



PRACTICE 2 – NAVIGATION

Use as page a reference when using your compass.

Download and print the Practice 2 - Navigation 11x17 file to practice your navigation skills.

