MAP READING - PEEL COUNTY.

The following is a suggested outline for map reading in each grade. This is not intended to replace the geography work in any grade.

Grade 2.

Directions.

A general idea of directions, north, east, south, west, as applied to the classroom, playground, sunrise and sunset.

The work should be concrete using sandtable to illustrate classroom and playground.

Grade 3.

Review directions taught in Grade 2.

Directions pupils go in going to and from school.

Map of desk (a) full size.
(b) reduced size - explain the need for reducing the size.

Map of room.

Map of playground.

Map of busiest intersection - this should be correlated with safety and health.

Meaning of - lake, river, oceans. Point out that these are always coloured blue.

Globe - to show shape of earth. Some device to show how the globe is flattened out, e.g. orange, cheap ball, football, bladders, etc., cut to demonstrate this.

Directions as applied to maps.

Continents and oceans.

Grade 4.

Review directions, route to and from school, oceans and continents.

Map of community showing - roads or streets, railways, child's own home, churches, schools and station.

Conventional signs used for the above buildings.

Map of Peel County showing townships, rivers, railways, highways, towns and villages.

Conventional signs for the above.

Grade 5.

Directions reviewed.

Signs reviewed.

All other required signs taught.

Estimating distances.

All work learned thus far to be applied to the work for the grade.

Grade 6.

Directions and signs reviewed.

Estimating distances.

Latitude.

(Over).

Map Reading - Peel County (cont:).

Longitude.

Practice in locating specific places using latitude and longitude.

All work learned thus far to be applied to the map work for the grade.

Grade 7.

Directions and signs reviewed.

Scale.

Contours.

Map references - 4 figure co-ordinates.

All above taught by using blackboard illustrations.

Using and reading maps.

Compass practice.

Grade 8.

Grade 7 work reviewed.

Romers.

Map references - 6 figure co-ordinates.

Compass practice.

Interpretation of contours.

NOTE - for this school year 1950-51, all of this course should be covered in Grade 8 and the previous years' work caught up in the other grades.

TOPOGRAPHICAL MAPS REQUIRED.

Brampton Sheet - all Toronto Township, Toronto Gore 5, Chinguacousy 1, 2, 3, 4, 5, 6, 7, 10, 13, 17, 22, 24.

Orangeville Sheet - Caledon 6, 7, 11, 13, 14, 15.

Bolton Sheet - all schools not mentioned above.

NOTE - These maps may be obtained from Map Distribution Office, Department of Mines and Resources, Ottawa. Price 15 cents. One map for every 2 or 3 pupils in Grades 7 & 8 will be sufficient.

Suggested Books - for this work, one for each school or Grade 7 & 8 rooms will be sufficient. Other books will, no doubt, be coming out later.

MAP READING.

Introduction - How Maps are Used.

Maps may be read and maps may also be interpreted. Map reading, like any other kind of reading, is simply the ability to recognize and to understand the symbols on the map. Not only the symbols as such but also directions, distances, relative locations, size, position on the globe, or any of the statistical, geographical, political, or cultural information which the map is designed to show. One of the great objectives in map making is to indicate all of these facts in so clear-cut a manner that the map may be almost easily and most accurately read.

Map reading, like any other kind of reading, is merely the first step toward the understanding of maps. Just as we spend several years merely learning how to read books, it is necessary also to spend a considerable time learning how to read maps. A child learns to read not only with his eyes but with his ears. He hears the teacher pronounce the words which he sees on the printed page. In map reading also the student grasps more fully what the map says by going out of doors and using the map in the actual locality which the map depicts. The use of the map "in the field" in this manner can hardly be too much encouraged. In these modern days of motor cars and other means of extensive travel people in general have learned much about map reading by using the map to find their way around. The sooner the student finds that a map is not just for the classroom, the greater will be his inclination to use maps to help him to understand his everyday affairs, activities and interests.

As a person grows in wisdom and understanding he finds much in literature which in his younger days escaped him. He learns how to interpret what he reads. He reads between the lines as it were. "Alice in Wonderland", written by a man of great maturity and wisdom, is easily read by youngsters, but only adults can interpret it. We older people can read it now with even more delight than we could when we were children. Mark Twain, too, is not only for the young. To the old and wise much is revealed which to the child is hidden. This is true also in the use of maps. What to the child is a wiggly road on the map is to an experienced map user a winding road with steep grades. The map says nothing about the topography, but with proper understanding the topography can be interpreted. The extent of one's ability to interpret depends upon one's understanding of geography. This wiggly road to which we have just referred may mean not only steep grades. It may mean also a terminal moraine with its corresponding soil types and topographic forms. Maps may reveal in fact much more about the country than the map maker himself suspected. An experienced user of topographical maps can actually visualize scenery.

Just as the ability to read maps with facility helps much in the ability to interpret them, so also does the ability to interpret them lead to a fuller and keener recognition of the mere facts which the map portrays. How many people, for example, notice that across Canada there runs a chain of lakes which, beginning with the Great Lakes, continues northward through Lake Winnipeg, Lake Athabasca, Great Slave Lake, and Great Bear Lake to Coronation Gulf in the Arctic. In Europe there is a similar chain of water bodies running from the Baltic Sea through the Gulf of Finland, Lake Ladoga, and Lake Onega to the White Sea in the Arctic. These are analogous features in the pattern of the two continents whose similar arrangement would not be noticed if their similar character were not understood. It all means that the ability to interpret the map focuses attention upon the mere facts which the map portrays. This means more intelligent reading.

How Maps are Interpreted -

Map interpretation can be greatly facilitated by expressing two sets of facts upon the map at the same time so as to emphasize the relation between the two. For instance, a map showing the distribution of forests superimposed on a map showing the distribution of rainfall exhibits a close correlation between the two. For this reason it is often desirable to use as a base a map which shows some aspect of the physical environment such as relief, climate, or topography, and upon this base show by dots or by some other symbol the distribution of people, crops, or any other cultural data. The correspondence between the two can then be more readily noted. This is really map interpretation - the seeking out of the meaning of the facts upon the map. A particularly striking example of this is the use of a topographic base for the representation of geological outcrops. The intimate bearing

of the geological structure upon the land forms then becomes quite evident.

Summary -

The lesson to be learned from this article is that a complete understanding of maps is gained only after long experience. As knowledge of the world and its geography is acquired, maps become constantly a more serviceable tool. Step by step the student advances in his understanding of the world. Curiosity about the meaning of things, about the relationship between different sets of facts, means more in the long run than does extensive travel, desirable as that may be. It is to be hoped that teachers will take advantage of the opportunity which geography affords to develop the attitude of map mindedness that is so valuable an asset in the training of a world citizen.

Section 2.

Much information is always included in the margin of a map, and the student should be trained to make full use of the data thus supplied and to know where to look for the following information:-

1. What locality it deals with.
2. Its scale.
3. Its orientation, and the local Magnetic variation (North Point)
4. The conventional signs it employs.
5. The contour system and interval.
6. The date of issue or revision.
7. By whom and how it was made.
8. The system of reference and grid employed.
9. The names and numbers of adjoining sheets.

The following books, pamphlets and maps, etc. should be helpful in preparing and teaching a Map Reading Course:

1. Steps in Map Reading - Anderzhon - Gage and Co.
2. Topographic Maps - Ontario - Surveys and Mapping Bureau - Dept. of Mines and Technical Surveys, Labelle Building, Ottawa.
3. Silva Compass - Type 5 - Silva Ltd., Toronto, Ont.
4. By Map & Compass - MacMillan Co., Toronto, Ont.

Section 3.

Purposes.

1. The immediate aim is to train the pupil to use a large scale map so that he is able to form an accurate mental picture of the ground.

2. To lay the foundations for accurate map language so that the pupil can express himself effectively.

3. To lay the foundations for the intelligent use of all types of maps found in atlases.

Conventional Signs or Symbols.

A map is a picture of the ground from a very great height. In order to have an accurate picture, it is necessary to employ various symbols by which natural and artificial features are portrayed. These symbols are commonly called Conventional Signs.

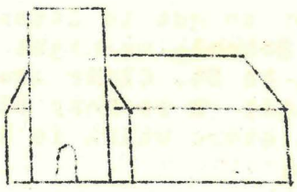
The object of conventional signs is to compress into the smallest possible space the largest amount of information which can be given without overcrowding the map.

The colours used for conventional signs are: black for detail; blue for water and marsh; brown for contours; red for electric power lines and green for woods.

(To give a person instructions on how to reach your house, for example, you need to tell him the direction, distance and the landmarks)

Dealing first with landmarks we note that the map contains many simplified pictures representing landmarks, features and objects. These pictures convey the same idea to most people and are so obvious in their representation that they are called Conventional Signs.

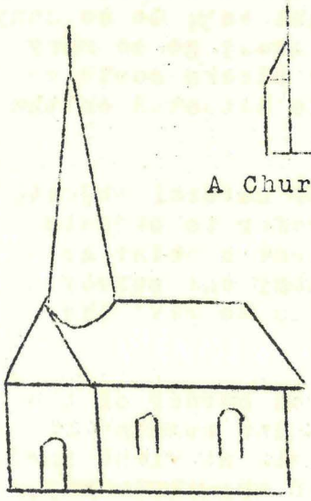
For Example:



A Church with a tower

becomes

(Cross denotes Church)
(Square tower from above)



A Church with spire

becomes

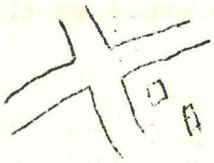
(Cross denotes Church)
(spire from above)

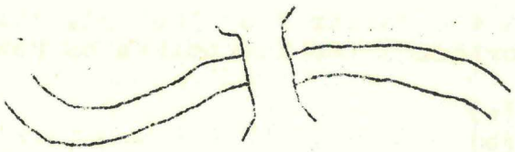
Have the children draw a maple tree and a fir tree in 5 seconds. Then compare their quick impression with the symbol:

Deciduous

Coniferous

Have them guess what they are looking at if they were up in an airplane and saw:





Teach the conventional signs on your <u>local</u> map - the ones they pass on the way to and from school, town, etc. Some of these would likely be:

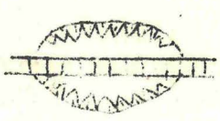
Cemetery, saw mill, Post Office, bog, quarry, railroad, railroad cutting, railroad embankment, lake, winding river, swift river with current, classes of roads, churches, mills, bridges, etc.

Every local map contains the conventional signs that are not obvious in a rectangle in the lower right margin, and lower left margin.

<u>Test the students:</u>

Primary reading flash card technique would be good.

Identify the following :(choose ones from your local map)

1. 

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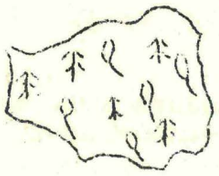
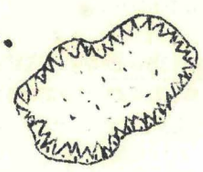
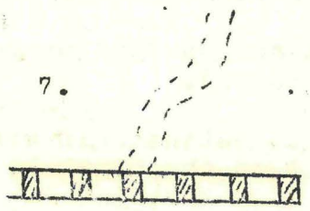
3. 

4. 

5. 

6. 

7. 

Make the conventional signs for:

Church with spire -
Orchard -

Swing Bridge -
Cemetery -

Embankment -
Saw Mill -

Level crossing -
Wagon road -

Section 4

Grid References -

1. If we wanted to tell someone how to get to Eaton's College Street store from Northern Vocational School, we might say, Go so many blocks south on Mount Pleasant Street, to St. Clair Ave.; go so many blocks west on St. Clair to Yonge Street; go so many blocks south on Yonge Street to Eaton's College Street store which is situated on the South-West corner of Yonge and College.

Rather than take any special building or other natural object, it has been found more convenient, when we want to refer to objects over a wide area and covered by several maps, to select a point as origin (or reference point) which is fixed by astronomy and surveying procedures and to mark grid lines on them to enable us to give the references of features conveniently.

The point of origin is always at the South-West corner of the area to be surveyed. A line is drawn through this point running due north and south and another is drawn through the origin at right angles to the former extending in an easterly direction. If the whole map, consisting perhaps of many sheets, be covered with lines drawn parallel to the aforementioned at intervals representing 1000 yards, a grid system is established representing a rectangular co-ordinate system. The co-ordinates are distances measured East and North from the point of origin of a grid system and are used to define the position of a point.

2. Find the grid lines on the map noting the yards represented (1000 yd) and the way the numbers increase to the east and the north.

3. Find the "square" or 1000 yd. grid reference (four figures - easting, northing) for the points on your sheet and noted on the blackboard

(a)
(b)
(c)
(d)

4. Make an accurate but improvised scale marked off in intervals representing 100 yards. (not a romer yet). Make accurate eastings and northings for the points on your sheet as noted on the black board and put them together for six figure map references as follows:

(a) Find the number of the grid line West of the given point and note. Ascertain the number of tenths the given point is east of that line. Write these numbers consecutively to form a single number. This is known as the easting reference.

(b) Find the number of the grid line south of the given point and note. Ascertain the number of tenths the given point is north of that line. Write these numbers consecutively to form a single number. This is known as the northing reference.

(c) Now, combine the numbers in A and B using the easting reference first and the combined number represent a six figure map reference.

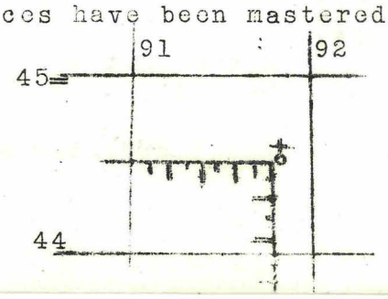
Remember - Always measure over to the east and then up to the north. In other words, find the easting and then the northing.

5. Give a six figure reference for the points on your sheet and noted on the black board.

6. What do you find on your map at the following reference points (see black board).

7. Try to estimate in six figure references the points on your map as noted on the black board.

8. References can be easily given by a romer (which can be taught when references have been mastered) viz.



Reference.

918445

Section 5.

Scales -

1. Everything must be drawn exactly to scale in any accurate plan or map. We may, of course, choose any scale we like for a plan for our own use, but for official plans and maps particular scales have been chosen.

2. The scale of a map is the proportion which the distance between two points on a map bears to the actual distance between the two points on the ground.

3. The scale 1" - 1 mile is often expressed on a map as:
$\frac{1}{63,360}$ - Distance on the map.
Distance on the ground.

4. Stating a scale as $\frac{1}{63,360}$ is expressing it as a Representative Fraction.

5. At the centre of the bottom margin of your map is the scale expressed in miles and yards. To the left of 0, is a scale breaking the mile and 1000 yard lengths into fractions.

6. Now proceed to do some measuring:
(a) as the crow flies (Ignore elevation)
(b) By road or circuitous route. (Involving conventional signs, grid co-ordinates and scales.

Note. Problems will be on Blackboard.

7. (a) Take class to campus and have them estimate 100 yards.
(b) Have class estimate distances to outstanding landmarks.
(c) Verify by map measurements.

8. An interesting variation is pacing.
Pacing is the means usually adopted to measure distance on the ground, when we only require an approximate result.

The first rule in pacing is to walk at your natural gait - don't try to pace an even yard. You pace known distances several times, counting your paces carefully. Then you find out how many of your paces add to 100 yards, and you will be able to convert your paces into yards fairly accurately.

Remember - Length of pace varies on level ground, up hill, down hill, and on mixed surface.

9. Method of calculating deduction to change paces into yards.

E.g.Level ground.
Measure off a course of 100 yards. Pace this distance 5 or 6 times and take average. Say it is 135 paces - then in 135 paces you must deduct 35 to make paces into yards - which is $\frac{35}{135}$ in one pace or $\frac{35}{135} \times 100 = 26$ in 100 paces (approx.) Thus the distance travelled in yards would be approximately 74% of the number of paces taken.

10. Have students pace distances between objects, which are marked on the map; turn these paces into yards, and then compare the result with scaled differences.

11. Always plan your nature hikes and social studies excursions from your maps and take your maps with you.

Section 6.

Contours -

1. You have already noted certain features depicted on the maps you have been studying, which have been represented by Conventional Signs. There are, however, such land forms as hills, valleys, etc. which are probably more important. These are difficult to depict simply and clearly on a map. Earlier Map Makers tried to draw them by shading, or pen-strokes, but these means were all unsatisfactory.

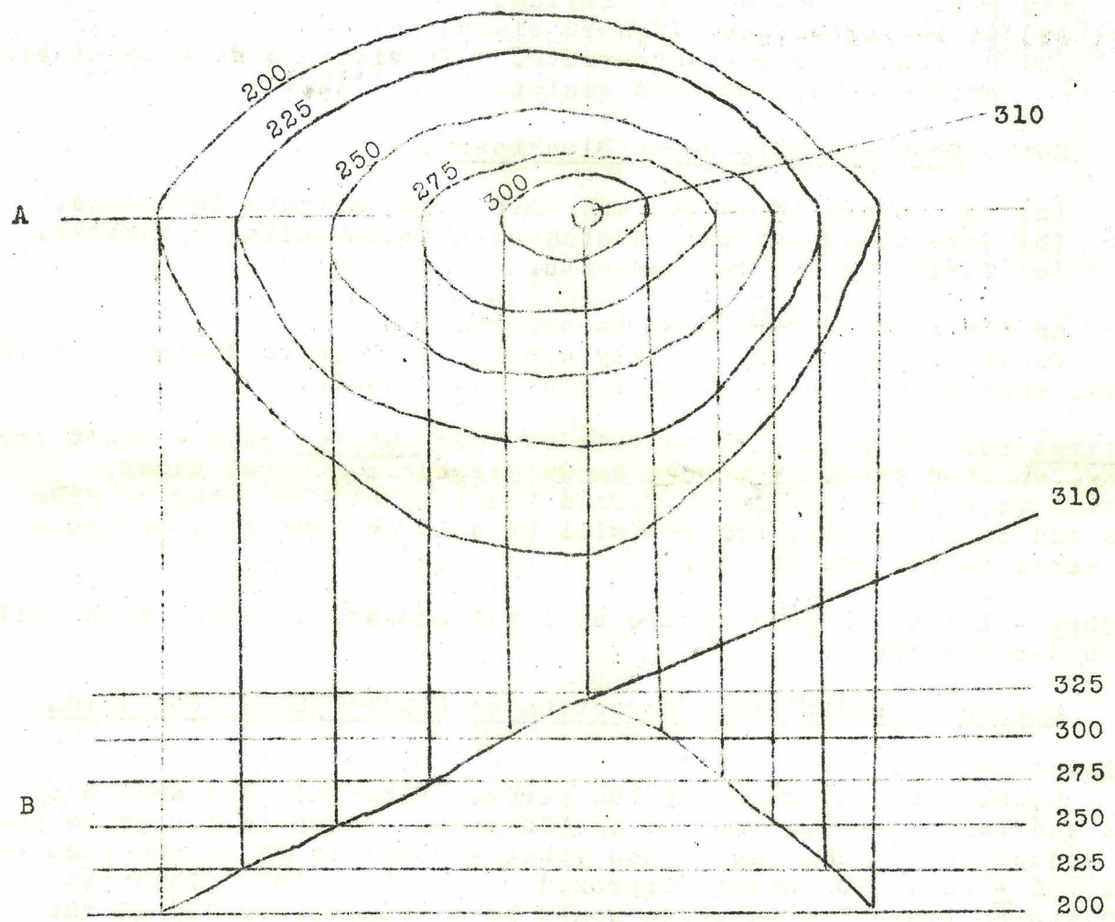
2. Another device is to show, in figures, the height above mean sea level. The points usually selected are the tops of hills and road junctions. These points are referred to as spot heights. One would need so many of them to tell the shape of the ground from spot heights, that the rest of the detail would be obscured, and the multiplicity of numbers would be very confusing. Instead, map makers adopted the device of drawing a line which joins all points which are

the same height above sea level. Such a line is called a contour, because it indicates the contour, or shape of the ground.

3. When we see such a line on the map, usually with a figure against it, we know that every point on that line is so many feet above sea level. There will be other contour lines, higher and lower than the one we are considering, and we can tell which are the hills and which are the valleys by the shape and relation of each other of these lines.

4. Contour lines on our map are brown in colour. They represent the shape of the ground by giving the height above mean sea level. (M.S.L.) Successive contour lines have between them a perpendicular height which is known as a vertical interval. The interval between contours is constant and on the map which we are studying it is twenty-five feet.

5. Following is a diagram made up of Sections A and B. A section represents the contour lines as they would appear on a map. B section represents the actual ground as it would appear if you were viewing it from a low-flying aeroplane.



6. (a) Close contour lines indicate a steep slope. When they are far apart they represent a gradual change of level.

(b) Spot heights are highest points between contour levels and are marked: e.g. 310

(c) The vertical interval is the perpendicular rise between two successive contours.

7. Experiment to illustrate contours using a model hill in aquarium tank.

8. Suggested problems:

(a) Is it possible to see directly between two certain named points?

(b) Why do farmers do contour ploughing? How do contour lines resemble contour ploughing?

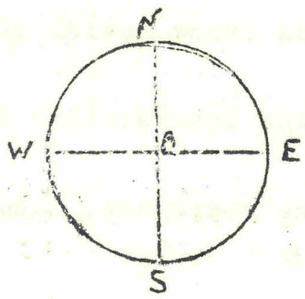
(c) Where is the highest spot on the sheet?

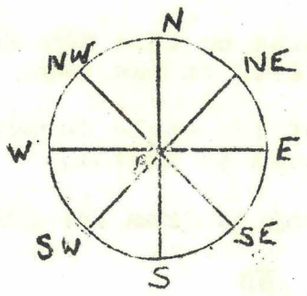
(d) Look for signs of intermittent creeks (blue). Give the reference, discuss the slope and state of forestation. Is erosion present in this area? Why should there be a planned woodlot?

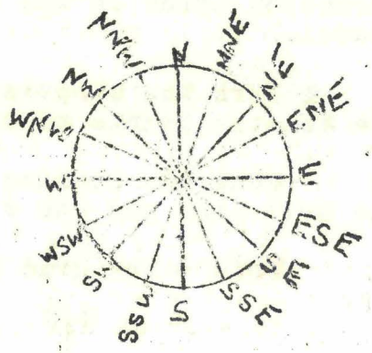
Section 7.

Finding Direction -

1. Direction is one of the items of information necessary to know in moving from one place to another. The following diagrams illustrates the progressive division of a circle into sixteen divisions and notes the directions from a person standing at point A and facing north.

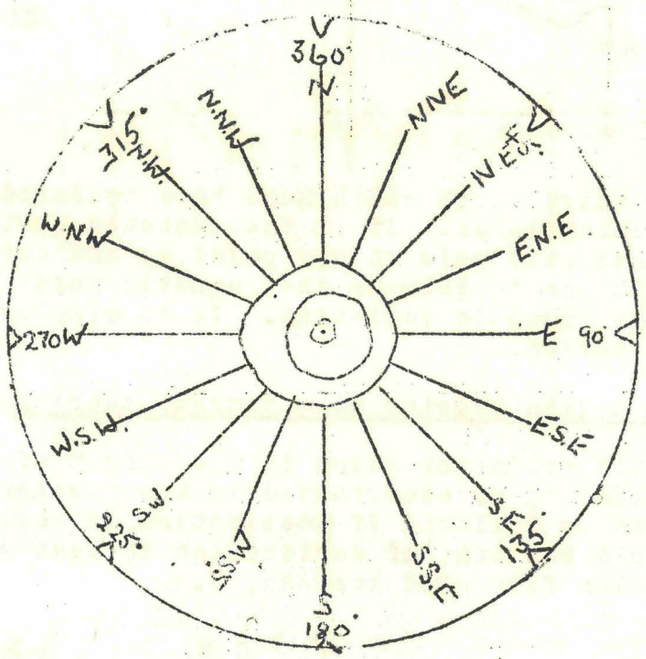






The foregoing illustrates how direction is described for general purposes, but in navigation, or in crossing a tract of land with no unmistakable landmarks, it is not precise enough to guide one to a definite destination such as a village, cross-road, etc.

2. The following diagram illustrates a compass. You will note that the circumference of this compass is divided into 360 parts each of which is called a degree. Each degree in turn is divided into 60 parts each of which is called a minute. This division is not illustrated on the compass. The foregoing represent 21,600 ways to go. Direction may be measured in degrees and minutes by a protractor on a map and translated to and followed on a compass.



By the use of the compass, we can describe directions in terms of degrees and call them "Bearings."

3. Measuring with a Protractor.

It is necessary to understand certain terms before proceeding to measure with a Protractor. When considering Bearings you will come in contact with the terms True North and Grid North. What do they mean?

(a) True North means the direction of the North Pole from the observer. It is evident that the meridian of an observer in England, and that of another observer in Moscow, will not be parallel straight lines.

(b) Grid North is the direction in which the grid lines point towards the top of the map. To be of value a grid must be rectangular. It is obvious that if the grid lines everywhere point to true North, the grid cannot be rectangular. It is usual to make one grid line coincide with the meridian. On this standard meridian the grid points to the true North. All other grid lines are drawn parallel to it and

do not point to the true North, but in each case to a different and imaginary point called the grid north. This permits the division of the map into rectangular grids as noted on the map before you.

STEPS in taking a Grid Bearing: (Silva Compass)

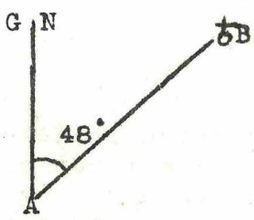
1. Place the compass on the map so that either long edge of the transparent plate coincides with the line you wish to travel and the direction arrow on the transparent plate points in the direction of travel.

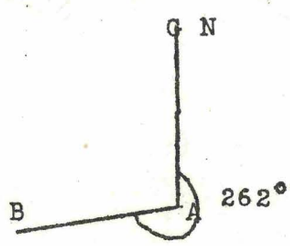
2. Turn the compass housing so that the ingraved arrow inside of the housing points to Grid North on the map.

3. Read the Bearing - (of the angle formed by the intersection of the Grid line and the direction to travel).

Note - the grid bearing is from the grid line clockwise, viz.

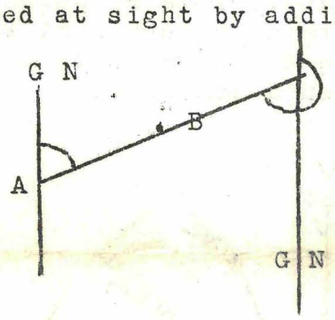
G N-Grid North
A-Location
B-Destination





A

(a) Examples of readings up to 180 degrees.
(b) Examples of readings between 180 and 360 degrees.
(c) Note that the bearing of A from B is the reverse of A to B and can be computed at sight by adding or subtracting 180°.



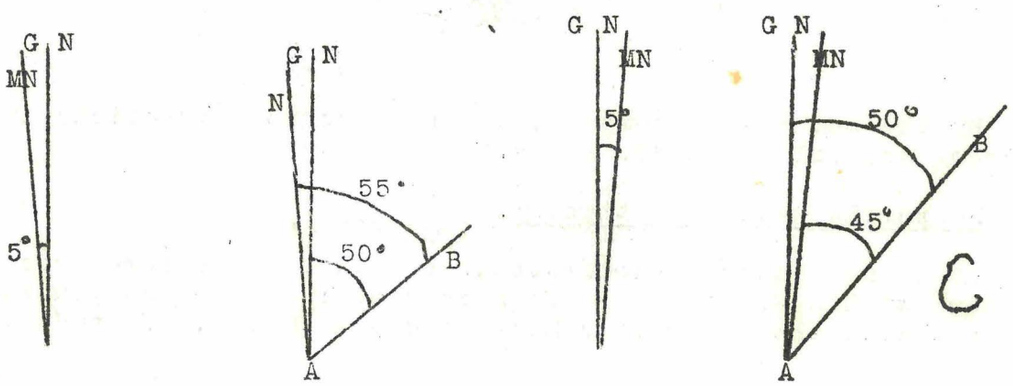
AB - 68°
BA - 248°

B

4. There is a third north which must be considered when a compass bearing is to be established. It is the magnetic north and is the direction of the magnetic pole at any point as indicated by the compass needle. The angle between the magnetic north and the true north is called the magnetic variation. It is also referred to as the magnetic declination.

5. To convert a grid bearing to a compass bearing:

1. Note the magnetic variation given in the margin of the map.
2. Note the grid bearing as ascertained in the previous examples.
3. Make corrections as follows: If declination is west add magnetic variation to grid bearing; if declination is east subtract magnetic variation from grid bearing, e.g.



C

Brampton. November 8, 1950

E. R. UNDERHILL.

Public School Inspector.