



**GREEN**

# MAP READING 2

*Pathfinder Level*

## Purpose

This badge will confirm what you have learned at Explorer level and enable you to read a map using six-figure grid references and identifying features at given points. You will also learn to use and identify the parts of a compass and obtain magnetic bearings.

## Exploring

Equipment required for this badge.

A topographical map, (avoid tourist road maps as most do not have grids), a compass, pencil and paper.

### THE MAP

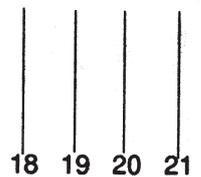
1. Explain the following marginal information and how it is used.

- a. Name ..... 04 \_\_\_\_\_
- b. Conventional signs ..... 03 \_\_\_\_\_
- c. Date map was made ..... 02 \_\_\_\_\_
- d. Sheet and edition number ..... 01 \_\_\_\_\_

(Fig.1)

2. Draw the following conventional signs.

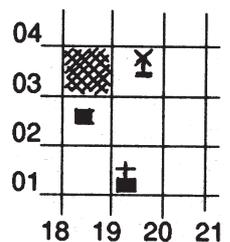
- a. House/building
- b. Track
- c. River
- d. Railway
- f. Trig Station



(Fig.2)

3. If you scored under 60% for the above questions ask your Counsellor to review the Explorer level badge with you.

4. Unfold your topographical map and you will find that the map is covered in lines which divide the map into squares. These squares are called Grid squares. At the bottom and



(Fig.3)

sides of your map you will notice that the lines that make up the squares are numbered with the numbers ranging from 00 to 99.

The lines that run across the page are called **Northings** (fig.1) because they divide the map from bottom to top or from South to North. (Note: the top of all maps point North).

The lines that divide the map from West to East are called **Eastings**

When the Eastings and Northings are combined they form the **Grid Squares** (fig.3). You will notice that each Grid Square is numbered. The numbers relate to the bottom left hand corner of the Grid Square and identify the square immediately to the right of the Easting and above the Northing.

The hatched square in fig. 3 is therefore identified as Grid Ref. 1803.

- 5. Identify five grid squares on your topographical map to your Counsellor, using a four figure grid reference as above (a little hint: you always read the numbers printed on the bottom of the map before you read the numbers up the side.

To help you remember here's a little catch phrase.

*Cross the creek before you climb the tree.*

- 6. At the bottom of your map you will find a **bar graph** which is designed to show you the **scale** of the map. Compare the distance between any two parallel grid lines with that of the little hatched area between 1 and 0 on the extreme left of the bar. You will find it is the same.

What is the distance between the two Grid lines?

- 7. If your Grid size is 1 km x 1 km, one Grid Square is 1 km<sup>2</sup>. That is still a big area, so to enable someone to locate a place within 100 m<sup>2</sup> we divide each square into 100 small squares. Look at Grid Ref. 18 02 in fig.3. What is in the middle? We can locate this item with a **six-figure grid reference**. Divide both horizontal and vertical grid lines into 10 equal parts. The house is about half way along the bottom line (Northing) so we can say the position is 185 02. It is also halfway between 02 and 03 of the vertical or Easting, giving us 185 025. This is the **six-figure grid reference**.

- 8. Identify and obtain a **six-figure grid reference** for the objects located in **grid squares** 1903 and 1901. Write down your answers.

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- 9. With your Counsellor's help work out how big an area is covered by a six-figure grid reference on the map you are using.

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- 10. Write down the name of the map you are using and give five (5) six-figure grid references on that map.

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### THE COMPASS

A map of your own district will help to do this exercise.

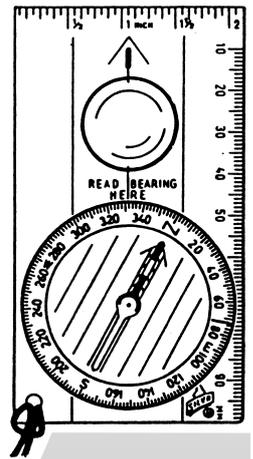
The compass has been in use for centuries by explorers and mariners on their journeys. You will most likely use a compass when orienteering or on a Cadet Hike.

Although the compass is an old instrument it is basically a very simple instrument.

The compass needle is magnetised and points to magnetic North. If you are too close to electrical or metallic objects, (wire fences, cars, metal belt buckle) the needle may be deflected from magnetic north due to the stronger pull of the metallic object or the electrical interference. Always stay about 10 metres away from these when reading a compass.

A compass has three basic parts: the needle, the housing and the base. The above diagram is of a **Silva** compass.

All a compass does is tell you where **Magnetic North** is. The rest is up to you. To be able to use a compass you need to know how to obtain a **bearing** and how to use the **bearing**. Bearings may be obtained in two ways:



**1. It may be given to you.**

- a. Draw the compass in your project book and name the three basic parts.
- b. Rotate the Housing until 60 degrees is lined up with the middle line of the **Direction of Travel Arrow** (that's the big red one printed on the compass base).
- c. Hold the Compass level in the palm of your hand or lay it down on a flat surface away from ferrous metals.
- d. When the needle has stopped moving rotate the compass carefully so that the North (0 degrees) is aligned with the red tip of the magnetic needle.
- e. The direction of travel arrow is now pointing at 60 degrees and you would move in that direction.

**2. You work out your own bearing.**

- a. Hold the compass level in the palm of your hand or place it on a level surface with the **Direction of Travel Arrow** pointed in the direction you intend to go.
- b. When the needle has stopped moving, rotate the **housing** so that the North (0 degrees) is aligned with the red tip of the magnetic needle.
- c. Read the degrees where the Housing and the middle line of the **Direction of Travel Arrow** meet.
- d. Write the bearing (degrees and direction) .....
- e. Place your map open on the table, place your compass on top of the map with the Red Needle pointing to the map's Grid North (turn the map, not your compass). The **Direction of Travel Arrow** will now show you on the map where you are going.
- f. Repeat this exercise four more times.  
If you carry out this exercise in the field, you will be able to identify the features in front of you correctly on the map.

**Doing**

1. Demonstrate to your Counsellor that you can identify the three basic parts of the compass and eight compass directions by name (East, North etc.)
2. Prove to your Counsellor that you are able to identify the direction required using at least five bearings given to you by your Counsellor.
3. From where **you** stand work out the bearing of three directions your Counsellor gives you with the aid of a compass.

This completes the Pathfinder level of Map Reading. The Builder Rank of Map Reading will give you more exciting things to do and learn.

Ask your Counsellor to sign below and arrange for the presentations of your badge.

..... date .....

**REFERENCES**

The patrol goes to camp. The Scouts Association of Australia (Available at Scout shops).  
Australian Road Atlas, published by George Phillip & O'Neil, Lands Department in your State.

Help available to Counsellors: Policemen, State Emergency Services,  
Defence Personnel (current and past), Local Army Cadet unit.