ROYAL CANADIAN ARMY CADETS

RED STAR

INSTRUCTIONAL GUIDE

SECTION 6

EO M222.06 – FOLLOW A MAGNETIC BEARING POINT TO POINT

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-702/PG-001, Chapter 4. Specific uses for said resources are identified throughout the Instructional Guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prior to this lesson, using a topographical map, prepare a navigation route, consisting of a minimum of six legs no greater than 100 m apart.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

Demonstration and performance was chosen for TP1 and TP2 as it allows the instructor to explain and demonstrate following a magnetic bearing point to point while providing an opportunity for the cadets to practice following a bearing point to point under supervision.

A practical activity was chosen for TP3 as it is an interactive way to allow cadets to experience following a magnetic bearing point to point in a safe, controlled environment. This activity contributes to the development of navigation skills and knowledge in a fun and challenging setting.

INTRODUCTION

REVIEW

The review for this lesson is from EO M222.05 (Orient a Map Using a Compass).

QUESTIONS

Q1. What is the first step to orienting a map using a compass?

Q2. What direction is the compass mirror to be pointed on the map?

Q3. How are the map and compass aligned together?

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ANTICIPATED ANSWERS

A1. Set the declination on the compass.

A2. The top of the map or north.

A3. Line up one side of the compass base plate with an easting line.

OBJECTIVES

By the end of this lesson the cadet shall be expected to follow a magnetic bearing point to point.

IMPORTANCE

It is important for cadets to know how to determine the magnetic bearing of a prominent object, take a magnetic bearing on a map and follow a magnetic bearing so they will be able to navigate a route during orienteering and expedition training.

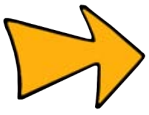
Teaching point 1 — **Practice Determining the Magnetic Bearing of a Prominent Object**

Time: 10 min — Method: Demonstration and Performance

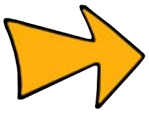


Divide cadets into equal groups according to the number of compasses available. Arrange the cadets so they can see the demonstration and hear the explanation of determining the magnetic bearing of a prominent object as listed below.

A compass can be used to identify the cardinal points such as north and south, the direction of travel and the bearing from one's current location to a prominent object. However, the ability to take a magnetic bearing of a prominent object and to use that information to help identify one's general location can save hours when trekking. A magnetic bearing is a quick method for describing the direction of travel.



To build navigation skills, it is useful to have cadets approximate their bearings prior to taking a bearing with the compass.



A prominent object is something that is large and easily seen (e.g. church or hilltop).



For this skill lesson, it is recommended that instruction take the following format:

(1) Explain and demonstrate the complete skill while cadets observe.

(2) Explain and demonstrate each step required to complete the skill. Monitor cadets as they imitate each step.

(3) Monitor the cadets' performance as they practice the complete skill.

Note: Assistant instructors may be employed to monitor cadet performance.

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Figure 1 Determining a Magnetic Bearing

To determine the magnetic bearing of a prominent object:

1. Check and set the pre-determined declination on the compass.
2. Hold the compass at eye level, at arms length, and face the prominent object.
3. Aim at the object using the compass sight, ensuring the sighting line is in line with the index pointer.
4. Adjust the compass cover so the compass dial is seen in the sighting mirror.
5. Look in the mirror and turn the compass dial until the magnetic needle is over the orienting arrow (red in the bed).
6. Read the number on the compass dial at the luminous index pointer. The magnetic bearing of the prominent object is read at the luminous index pointer.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What is a magnetic bearing?

Q2. Where must the magnetic needle be when looking in the mirror and turning the compass dial?

Q3. From where is the magnetic bearing of the prominent object read?

ANTICIPATED ANSWERS

A1. A magnetic bearing is a bearing that is measured between two points using a compass.

A2. The magnetic needle must be over the orienting arrow (red in the bed).

A3. The magnetic bearing is read from the luminous index pointer.

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Teaching point 2 **Explain, Demonstrate and Have the Cadets Practice Taking a Magnetic Bearing on a Map**

Time: 15 min Method: Demonstration and Performance

The ability to measure a bearing from a map allows cadets to plan routes or activities before going into the field, and allows an easy method of communicating information about movement or location. When a compass is adjusted to compensate for declination, it will provide the equivalent of a magnetic bearing. Magnetic bearings may be set on the compass without further conversions.



For this skill lesson, it is recommended that instruction take the following format:

(1) Explain and demonstrate the complete skill while cadets observe.

(2) Explain and demonstrate each step required to complete the skill. Monitor cadets as they imitate each step.

(3) Monitor the cadets' performance as they practice the complete skill.

Note: Assistant instructors may be employed to monitor cadet performance.



D Cdts 3, 2007, Ottawa, ON: Department of National Defence

Figure 2 Measuring a Magnetic Bearing on a Map

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To measure a magnetic bearing on a map:



Prior to measuring a magnetic bearing on a map it is good practice to first estimate the bearing by drawing a quick compass rose and looking at where the bearing would be on the compass rose. This serves as a good check to ensure the cadet has not accidentally measured the back bearing.

1. Set the pre-determined declination on the compass.

2. Identify and mark the start (point A) and finish (point B) points on a map.

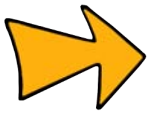
3. Draw a plotting ray from point A to point B.

4. Lay the fully opened compass with the edge of the compass base plate along the plotting ray, in the direction of travel (point A to point B).

5. Hold the compass in place, rotate the compass dial so that the compass meridian lines align with the easting lines on the map, ensuring north on the dial indicates north on the map.

6. Read the number on the compass dial at the luminous index pointer.

The magnetic bearing is read at the luminous index pointer.



If the bearing is taken from point B to point A, the compass will be pointing 180 degrees or 3200 mils in the exact opposite direction of travel wanted. This is also called a back bearing.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. What is the first step to measuring a magnetic bearing on a map?

Q2. What direction along the plotting ray must the compass be laid?

Q3. With what lines on the map must the compass meridian lines align?

ANTICIPATED ANSWERS

A1. Setting the pre-determined declination on the compass.

A2. In the direction of travel – point A to point B.

A3. The compass meridian lines must align with the map easting lines.

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Teaching point 3 **Follow a Magnetic Bearing Point to Point**

Time: 25 min Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have cadets follow a magnetic bearing point to point.

RESOURCES

- Topographical map (one per group), and
- Compass (one per group).

ACTIVITY LAYOUT

Navigation route consisting of a minimum of six legs, no greater than 100 m apart in distance.

ACTIVITY INSTRUCTIONS

1. Divide cadets in groups of four to six.
2. Issue each group with a map and compass.
3. Have a different cadet in each group take a magnetic bearing on a map during daylight.
4. Have each cadet take a turn leading the group, while following a magnetic bearing point to point.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in following a magnetic bearing point to point will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. What is the definition of a prominent object?

Q2. What is the definition of a magnetic bearing?

Q3. What numbers indicate the magnetic bearing?

ANTICIPATED ANSWERS

A1. A prominent object is something that is large and easily seen (e.g. church or hilltop).

A2. A magnetic bearing is a bearing that is measured between two points using a magnetic compass.

A3. The numbers shown at the luminous index pointer indicate the magnetic bearing.

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CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

CLOSING STATEMENT

Being able to determine the magnetic bearing of a prominent object, take a magnetic bearing on a map and follow a magnetic bearing will assist the cadets in navigating a route during orienteering and expedition training.

INSTRUCTOR NOTES/REMARKS

N/A.

REFERENCES

A2-041 B-GL-382-005/PT-001 Canadian Forces. (2006). *Maps, Field Sketching, Compasses and the Global Positioning System*. Ottawa, ON: Department of National Defence.

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