ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL THREE

INSTRUCTIONAL GUIDE

SECTION 11

EO C390.06 – DETERMINE DIRECTION USING THE SUN

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-803/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.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

Demonstration and performance was chosen for this lesson as it allows the instructor to explain and demonstrate determining direction using the sun while providing an opportunity for the cadets to practice the skill under supervision.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have determined direction using the sun.

IMPORTANCE

It is important for the cadets to be able to determine direction using the sun so in a survival situation they can navigate to and from their survival site without the aid of a compass or map.

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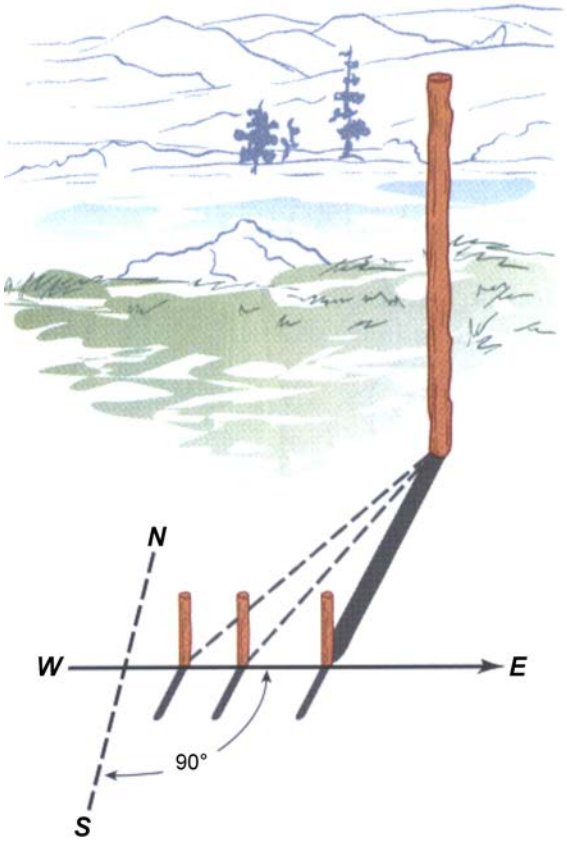
Teaching point 1 **Explain, Demonstrate and Have Cadets Determine Direction Using a Shadow Stick**

Time: 15 min Method: Demonstration and Performance

DETERMINE DIRECTION USING A SHADOW STICK

In a survival situation, one may not have a map of the area, a compass or the use of a watch. On this occasion, it may be necessary to use natural guides, such as the sun to determine direction. The sun can be used to find north using a branch or stick to cast a shadow on the ground.

A shadow stick works because the sun always travels east to west, even though it may not rise at exactly 90 degrees or set at exactly 270 degrees. The tip of the shadow stick's shadow moves in the opposite direction, so the first shadow tip is always west of the second, anywhere on earth. Improvised methods are only general indicators of direction. The shadow stick is more accurate and easier to read when the stick is narrow.



National Association of Search and Rescue, Fundamentals of Search and Rescue, Jones and Bartlett Publishers, Inc. (p. 76)

Figure 1 Shadow Stick

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets construct a shadow stick and determine direction using the sun.

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RESOURCES

Stick.

ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of three or four.

2. Have the cadets find a 45–60 cm straight stick.

3. Find a level vegetation-free spot. Push the 45–60 cm straight stick into the ground about 10 cm so it will remain upright, inclining it by 5–10 degrees to create a longer, bigger shadow.

4. Mark the tip of the shadow with a stone. Wait until the shadow tip moves several centimetres (10–15 minutes with a 45 cm stick).



Use the time interval required for Step 4. to instruct TP 2.

5. Mark the position of the new shadow tip.

6. Draw a straight line from the first mark through the second mark and continue about 30 cm past it (as illustrated in Figure 18-11-1).

7. Have the instructor or a supervisor verify the bearings with a compass.



The line drawn indicates the east–west line. The first mark made is west and the last mark made is east. A line perpendicular to the east–west line is a north–south line.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in this activity will serve as the confirmation of this TP.

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Teaching point 2 | **Explain, Demonstrate and Have Cadets Determine Direction Using an Analog Watch**

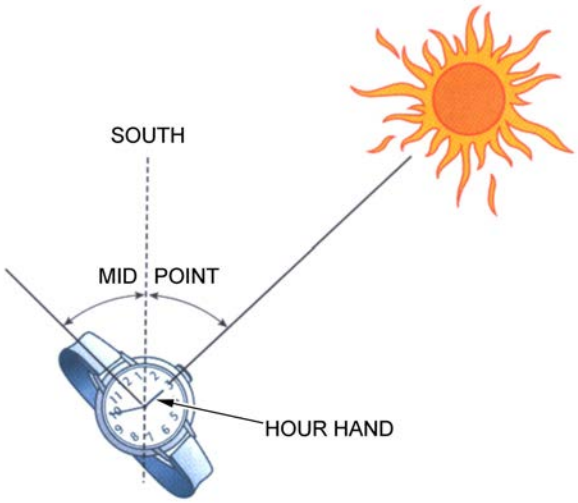
Time: 10 min | Method: Demonstration and Performance

Use an analog wall clock for demonstration purposes instead of an analog watch. Ask the cadets if any of them have an analog watch. Since digital watches are more common than analog watches, the cadets should understand that without one, they cannot use this method.

DETERMINE DIRECTION USING AN ANALOG WATCH

An analog watch can help establish direction using either standard or daylight savings time. The analog watch method is based on the principle that at noon (or 1 pm for daylight savings time) the sun is approximately due south in the northern hemisphere and approximately due north in the southern hemisphere. Using this principle, an analog watch's (with the correct time) hour hand, at noon, pointed at the sun, also points approximately due south/north. At times other than noon, bisecting the angle between the hour hand (pointing at the sun) and the 12 (or the 1 for daylight savings time) on the watch face, creates an imaginary line that points approximately due south/north.

This method becomes less accurate the closer a person is to the equator.



National Association of Search and Rescue, Fundamentals of Search and Rescue, Jones and Bartlett Publishers, Inc. (p. 76)

Figure 2 Analog Watch

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ACTIVITY

Time: 5 min

OBJECTIVE

The objective of this activity is to have the cadets determine direction using an analog watch.

RESOURCES

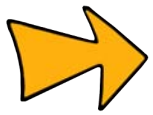
Analog watch (with the correct time).

ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

1. Point the hour hand towards the sun.
2. Determine the halfway point between the hour hand and noon (or 1 pm for daylight savings time).
3. Create an imaginary line between the centre of the watch face and the halfway point (as illustrated in Figure 18-11-2).



The imaginary line is a north–south line (points to the south in the northern hemisphere and to the north in the southern hemisphere).

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in this activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in constructing a shadow stick and determining direction using an analog watch will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

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CLOSING STATEMENT

It is important for the cadets to be able to determine direction using the sun so in a survival situation they can navigate to and from their survival site without the aid of a compass or map.

INSTRUCTOR NOTES/REMARKS

Sticks are to be collected by the cadets in the field.

REFERENCES

C3-002 (ISBN 0-00-653140-7) Wiseman, J. (1999). *The SAS Survival Handbook*. Hammersmith, London: HarperCollins Publishers.

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