



National Défense
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ROYAL CANADIAN ARMY CADETS



NATIONAL STAR CERTIFICATION EXAMINATION STUDY GUIDE

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FOREWORD

Congratulations! You have completed all four star levels of the Army Cadet training program and are now ready to take the National Star Certification Exam (NSCE). This exam is a momentous occasion for you and all leaders in the cadet program would like nothing more than for every army cadet to pass this exam. This is why the study guide was created.

We want to provide you with the tools to succeed. We have taught you everything in the star program and now we want you to review and confirm what you have learned. The NSCE is intended to be a confirmation of the knowledge and skills you have gained during your time as an army cadet, and it is our hope that this study guide will:

- Explain fully the content of the exam and how it is tested
- Help you review all the necessary material for the exam and help you solidify your understanding of this material, and
- Prepare you to for the exam by guiding you through a systematic and effective study program.

You now have a choice to make. You can either follow the program outlined in this study guide or you can cross your fingers and hope that you can remember everything that was taught to you in the last four years. Those cadets, who choose to take the preparation for the exam seriously and follow this guide, will be the cadets who excel on the NSCE.

I wish you all success on the upcoming NSCE.

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SECTION A

THE EXAM AND THE STUDY GUIDE



CONTENT OF THE NSCE

QUICK OVERVIEW

To pass the NSCE you must obtain a minimum of 60% on the written test, and pass all five skills tests.

The exam includes:

PHASE 1

A. Written General Knowledge Exam



*THERE WILL BE
NO RETESTS
GIVEN ON THE
WRITTEN EXAM*

PHASE 2

B. Army Cadets Fitness Test

C. Bushcraft Skills Test (knots and lashings)

D. Map and Compass Skills Test

- i. Determine a 6-figure grid reference
- ii. Identify the elevation of a point
- iii. Measure a distance along a route
- iv. Orient a map by inspection
- v. Plot a grid bearing
- vi. Calculate declination
- vii. Orient a Map with a Compass

E. Classroom Instruction Test

F. Drill Instruction Test



*RETESTS MAY
BE GIVEN ON
TESTS B-F, IF
ONLY
ONE TEST IS
FAILED*

Content of the NSCE

A More Detailed Look at the Exam

A. Written General Knowledge Exam

The written general knowledge exam has 100 multiple-choice and true false questions. Each question is independent of each other and in the case of multiple-choice questions, will have four answer choices. Each question is worth 1 point and there is a time limit of 90 minutes. That will give you at little less than one minute per question, which should give you ample time to complete the exam. The questions on the written exam are mostly theoretical and can be answered very quickly. Calculators are permitted, however, you will need to provide your own.

The general knowledge exam will test all areas of knowledge from the star program. Subject areas that are better tested by having you demonstrate a skill will not be on the written test; therefore, there is no map work on the written exam. All of the map and compass questions can be answered without using a map, compass or protractor. The test construct is as follows:

PO 402 Fundamental Training	16 questions
PO 403 Bushcraft	25 questions
PO 405 Map and Compass	16 questions
PO 406 Marksmanship	14 questions
PO 410 Public Speaking	3 questions
PO 411 Leadership	18 questions
PO 412 Citizenship	6 questions
PO 413 Physical Fitness	2 questions



Calculators are permitted on the exam; however, you will need to supply your own.



You will not be given a map, compass or protractor for this test; therefore, you will not have to plot bearings, measure distances, etc. on the written exam. Those skills are now part of the Map and Compass practical skills test.

B. Army Cadet Fitness Test

To pass the NSCE you must obtain, as a minimum, the Bronze level of the ACFT. If you are unable to complete any portion of the test due to either a permanent or temporary physical condition (i.e. sprain), you must have a doctor complete the form at Annex A to CATO 41-03. A copy of this form is included in Section D of this book, Preparing for the Exam Day. The doctor must state clearly if the condition is permanent or temporary.

Permanent medical condition. If you have a permanent medical condition that prevents you from attempting the ACFT, you must submit the doctor's form in ADVANCE to your CO who will submit it to the Area Staff. The staff at your Regional Headquarters will review your file and depending on your condition may grant you a waiver for the ACFT.

Temporary medical condition. If you have a temporary medical condition that prevents you from attempting the ACFT, you must submit the doctor's form in ADVANCE to your CO who will submit it to the Area Staff. If you pass all parts of the NSCE but have a temporary medical condition, you may be tested on the ACFT up until the end of August. You will not be given a pass on the NSCE until after the ACFT is completed. Until then your mark will be incomplete.

IMPORTANT NOTES: If you have either a temporary or permanent medical condition, it may not impede you from attempting all parts of the ACFT. You may be required to complete some parts of the fitness test.

If you attempt the ACFT, fail, and then report a medical condition, a waiver will not be granted; the failed mark will stand.



Waivers for the ACFT must be requested BEFORE attempting any part of the Physical Fitness Test.



The "Chin-up" on the ACFT has been replaced with the "Standing Long Jump". See Unit 16 for details.

C. Bushcraft Skills Test

Unit 12 explains this test in detail. To pass this test you will have to tie five of the eight knots listed below in a ten minute time limit.

- ✓ Thumb knot
- ✓ Clove hitch
- ✓ Half hitch
- ✓ Figure eight knot
- ✓ Double figure of eight (re-woven)
- ✓ Reef knot
- ✓ Bowline
- ✓ Fisherman's knot

D. Map and Compass Skills Test

The map and compass test has seven items. Because the written exam will only test knowledge and theory (not skill), you will be required to perform the following tasks:

- ❖ Given a point on a map, determine its six figured grid reference
- ❖ Identify the elevation of a given point
- ❖ Orient a map by inspection
- ❖ Plot a grid bearing (see Unit 11)
- ❖ Measure a distance along a route
- ❖ Calculate the magnetic declination of a given map
- ❖ Orient a map with a compass (see Unit 10)

E. Classroom Instruction Test

To pass this test you will have to receive at least 60% on a 30 minute classroom lesson. There is a copy of the assessment guide in Unit 13. After passing the General Knowledge Test, you will be assigned one of the following lessons to teach:

- EO 402.03 – Identify Officer and NCM rank structure in the Canadian Forces
- EO 402.06 – Identify badges and medals of the Royal Canadian Army Cadets
- EO 402.09 – Identify Canadian, provincial, territorial and Army Cadet Flags.
- EO 402.10 – List duties and responsibilities of a NCO
- EO 405.02 – State the meaning of conventional signs found on a topographical map
- EO 405.03 – Locate a specific point on a map
- EO 405.07 – Identify the parts of a compass and their functions
- EO 405.08 – Identify the points on a compass

You must prepare two copies of the lesson plan and give one to the evaluator prior to teaching. Any training aids you require must be prepared in advance and brought with you. A chalkboard or whiteboard and an overhead projector (OHP) will be available for your use.

IMPORTANT: Make sure you plan your lesson using the Lesson Specification Sheet from the Course Training Plan (CTP). The Army Cadet Reference Book only lists the EO number and the material to be taught, the CTP will provide valuable information on how the class is to be taught and may also identify additional resource information. This is especially critical for the drill lesson.

G. Drill Instruction Test

To pass this test you will have to receive at least 60% on a 30-minute drill lesson. There is a copy of the assessment guide in Unit 14. After passing the General Knowledge Test, you will be assigned one of the following lessons to teach:

- EO 401.01 – Adopt the position of attention, stand at ease, and stand easy
- EO 401.04 – Execute turns at the halt
- EO 401.05 – Execute paces forward and to the rear
- EO 401.06 – Execute the movements required for the right dress
- EO 401.07 – Salute with the hand at the halt
- EO 401.09 – Execute open and close order march
- EO 401.10 – Execute the movements for dismissal
- EO 401.15 – Fall-in and fall-out of the ranks

Changes and Highlights

The Cadet will be required correctly tie five of eight knots listed below:

- ✓ Thumb knot
- ✓ Clove hitch
- ✓ Half hitch
- ✓ Figure eight knot
- ✓ Double figure of eight (re-woven)
- ✓ Reef knot
- ✓ Bowline
- ✓ Fisherman's knot

USING THIS STUDY GUIDE

This study guide was designed to fully explain the NSCE and review all the necessary material. As you can see from the table of contents, this book is divided into five sections and then further divided into study units. The guide is presented in a logical manner that represents the two parts of the NSCE. Rather than list the study units in a specific study order, they are grouped by test. This will allow flexibility in the order topics are covered, while still clearly defining what is on each part of the exam. For example, the recommended study schedule suggests that you start with Unit 16 first. It is important that you identify now if you can pass the ACFT and if you need to start any physical training program.

Each study unit is organized in the following way:

- Unit Outline – This is a one-page summary of the reading, activities, quizzes and assignments for each unit.
- Pre-study Quiz/Activity – Each unit starts with a quiz to test your knowledge on the unit’s material. The answers are in Section E of this book. This will allow you to evaluate your knowledge and help you to spend the most time on your weakest areas. If you take the quiz and achieve at least 80% (with the exception of the skills tests), you should not spend much time, if any, on that unit. If you approach your study with the goal of receiving 100% on everything before you move on, you may not make it through the entire guide. Rather you should proceed to those areas where you need the most work and later return to the units you have done well on to try to improve your mark.

***Important note:** Each study unit is equally important to your success. It will not pay off to be an expert in Fundamental Training and weak on Map and Compass. Your goal must be to become competent in all areas that are tested*

- Unit Reading – This will include sections from the Army Cadet Reference Book (which are not reprinted here) and supplemental reading to enhance your understanding (which is included).
- Summary of Important Points – Some point form notes are included from the Reference Book reading. To be confident on the material, you must be able to elaborate on each point listed. If you cannot you should re-read the material. THESE NOTES DO NOT REPLACE THE READING. If you review only these point form notes, you will not be prepared to pass the unit. The notes are only included to ensure you do not miss any important points.
- Quiz/Activity – This second quiz or activity is a confirmation of your understanding of the material after you have completed the study portion of the unit. The answers to this quiz or activity are included in Section E of this book.

- Unit Assignment – This is the final confirmation of your understanding. The answers to the assignments are not included in this book; however, your corps' CO or Trg O will have an answer guide. Once you have completed the assignment you are to pass it to your Trg O or NSCE instructor for marking.

Throughout this study guide you will find tips and comments in the margins. These are there to help you. They are grouped into three categories and are preceded with the following symbols:



The Test - This symbol is associated with test design and test taking strategies. The notes in this area will tell you what to expect and give you tips on test preparation and writing.



Ideas – This symbol is associated with ideas to stimulate thought and ideas for extra study options. Cadets who follow the advice here will be the ones who excel on the exam.



Common Mistake – This symbol is associated with some of the most common mistakes made on the test.

CAUTION: This study guide is not merely a collection of exam questions. In actual fact, the officers who wrote all the questions in this guide have not seen the exam questions. Over the past few years many cadets have tried to prepare for the NSCE by writing as many past exams and practice exams as possible. This method of preparation relies on your ability to recall memorized facts rather than your understanding of the material. For a select few cadets this has worked; however, for the majority it has not. If you want to ensure your success, strive to understand the concepts presented in each unit. Not only will this guarantee that you pass the NSCE, it will also make the exam experience much less stressful.

SUGGESTED STUDY SCHEDULE

As you will notice, you have not been given an answer key for any of the assignments and some of the assignments require you to perform a skill. There is space left for you to write down specific dates. Your Training Officer may assign specific dates to some of the assignments, if not, I strongly urge you to set goal dates for yourself and stick to them.

This is only a suggested schedule and your Training Officer may modify this for you. This schedule is based on the assumption that you start studying the first week in October, have to write the written test in February and complete the skills tests in March.

Date of Phase 1 (Written Test): _____

Date of Phase 2 (Skills Tests): _____

Week 1:	Meet with your Trg O and set assignment due dates Find out when Part 1 and Part 2 of the NSCE are Complete Unit 15	_____ _____ _____
Week 2:	Read Explanation of NSCE Part 1 Study Unit 1 Quiz 1 Assignment	_____ _____ _____ _____
Week 3:	Study Unit 2 Quiz 1 Assignment	_____ _____ _____
Week 4:	Study Unit 3 Quiz 1 Assignment	_____ _____ _____
Week 5:	Practice the Army Cadet Fitness Test (2 nd time) Study Unit 4 Quiz 1 Assignment	_____ _____ _____ _____
Week 6:	Study Unit 5 Quiz 1 Assignment	_____ _____ _____

Week 7: Study Unit 6
 Quiz 1
 Assignment

Week 8: Study Unit 13
 Activity A

Week 9: Unit 13 Activity B
 Unit 13 Activity C

Week 10: Practice the Army Cadet Fitness Test (3rd time)
 Study Unit 12
 Activity A

Week 11: Unit 12 Activity B

----- **CHRISTMAS BREAK** -----

Week 12: Study Unit 7
 Quiz 1
 Assignment

Week 13: Study Unit 8
 Quiz 1
 Assignment

Week 14: Study Unit 9
 Quiz 1
 Assignment

Week 15: Study Unit 10
 Quiz 1
 Assignment

Study Unit 11
 Quiz
 Assignment

Week 16: Read Advice on Multiple Choice Exams
 Review assignments from Units 1-7

Week 17: **WRITE NSCE PART 1**

- Week 18:** Practice the Army Cadet Fitness Test (4th time) _____
Study Unit 12 _____
Quiz 1 _____
Assignment _____
- Week 19:** Unit 13 Assignment _____
- Week 20:** Unit 14 Assignment _____
Unit 12 Assignment _____
- Week 21:** Complete the checklists in Section D ‘Preparing
for the exam day’ _____

My Study and NSCE Results

<i>Study Guide</i>				NSCE	
		Date Completed	Mark	Test	Mark
Unit 1	Quiz			Part 1 Written Test	
	Assignment				
Unit 2	Quiz				
	Assignment				
Unit 3	Quiz				
	Assignment				
Unit 4	Quiz				
	Assignment				
Unit 5	Quiz				
	Assignment				
Unit 6	Quiz				
	Assignment				
Unit 7	Quiz				
	Assignment				
Unit 8	Quiz				
	Assignment				
Unit 9	Quiz			Identify a Grid Ref	P / F
	Assignment			Identify the elevation	P / F
Unit 10	Quiz			Measure a distance	P / F
	Assignment			Calculate Declination	P / F
Unit 11	Quiz			Orient Map w Compass	P / F
	Assignment			Measure a bearing	P / F
Unit 12	Quiz			Orient a map by insp.	P / F
	Assignment				
Unit 13	Quiz			Knots	P / F
	Assignment				
Unit 14	Activity C			Classroom Lesson	
	Assignment				
Unit 15	Activity B			Drill Lesson	
	Assignment				
Unit 16	Attempt 1			Army Cadet Fitness	
	Attempt 2				
	Attempt 3				
	Attempt 4				

SECTION B
NSCE PART ONE

UNIT 1

Fundamental Training and Citizenship

1. This unit should take you --- hour to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80% you should complete all the reading, activities, and exercised in this unit.
2. Reading:
 - a. Army Cadet Reference Book, Pages 2-1 to 2-50 and 12-1 to 12-44
3. Activities and Exercise:
 - a. Complete Unit 1 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit 1 Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Activity A & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.
 - b. Complete Unit 1 – Activity A, then check your answers.
4. Unit 1 Assignment: This unit’s assignment is a 10 question multiple-choice quiz. The questions are very similar to the type you will find on the Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 16 questions from this section on the written exam.

QUIZ 1

1. What qualification badges are placed on the left sleeve? What order are the badges placed in starting at the bottom of the sleeve?

5 –

4 –

3 –

2 –

1 –

2. When shall a cadet remove their headdress?

3. What are the three aims of the Canadian Cadet Movement?

4. What does the acronym CHAP stand for?

C –

H –

A –

P –

5. List all the General Ranks from most junior to most senior.

6. List and draw all the senior officer ranks.

7. When the National Anthem or Foreign National Anthem is played, what must you do if you are in uniform?

8. What is the Major General W. A. Howard medal awarded for?

9. Identify each of the following Provincial / Territorial flags.



10. How many different levels of the Order of Canada can be awarded, and what are they?

11. What is the Victoria Cross Awarded for?

12. What year was the Canadian Human Rights Act introduced? _____

13. When was the present Canadian National Flag proclaimed by Her Majesty, Queen Elizabeth II?

14. Name three types of Government.

15. What are the three levels of government in Canada?

ACTIVITY A

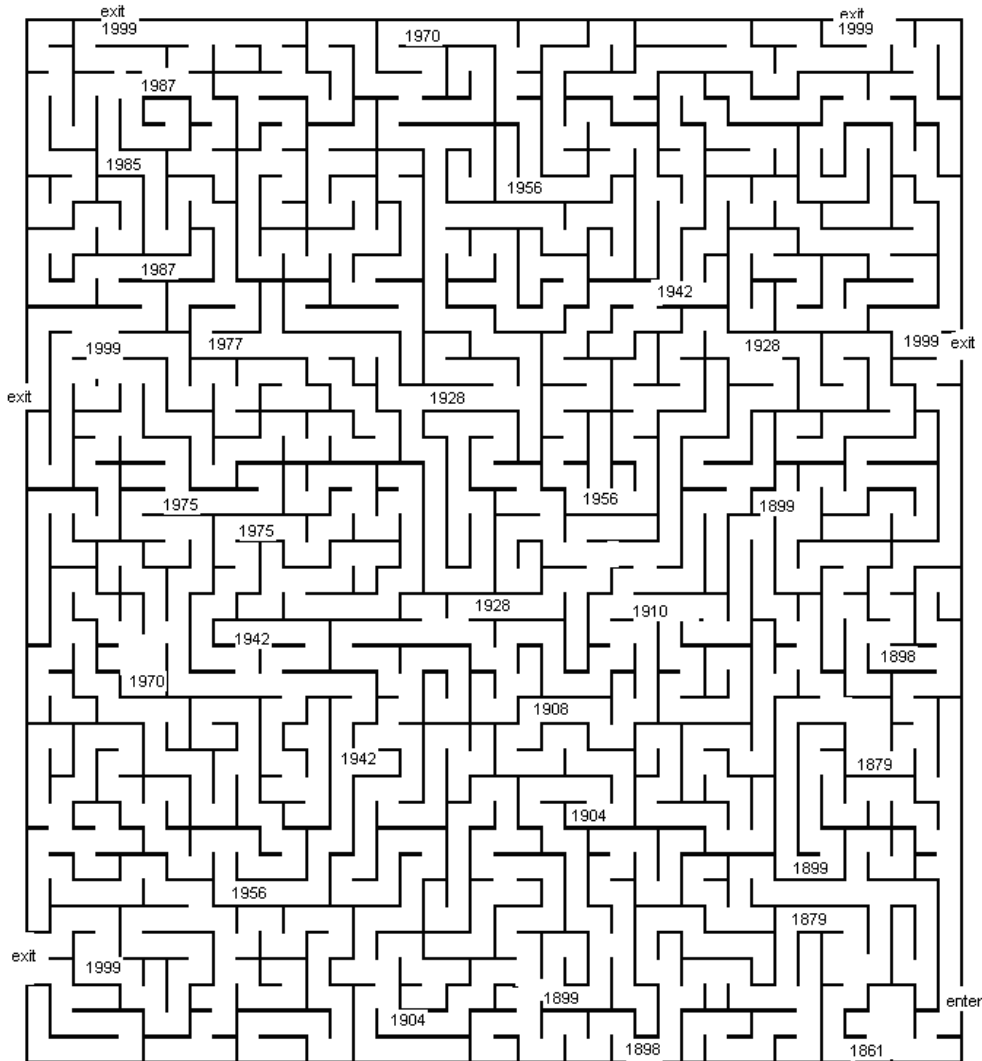
Match the correct action with the situation presented:

1. Cadet addressing an NCO _____
2. Cadet addressing an officer _____
3. Cadet entering an office _____
4. When a Cadet in uniform is present during the playing of the National Anthem or Foreign National Anthem _____
5. When a Cadet in uniform is formed up on parade during the playing of the National Anthem or Foreign National Anthem _____
6. When a cadet in civilian clothes is present during the playing of the National Anthem or Foreign National Anthem _____
7. A cadet is present in uniform when either of the following happens-the national flag is being lowered or raised, when the flag party marches by, the Army Cadet Banner and Cadet Flag are paraded and the Army Cadet Camp Flag is being raised or lowered _____
 - a. cadet will come to attention and salute
 - b. stand at attention
 - c. remove headdress and stand at attention
 - d. stand at attention, address the person by rank and surname and remain at attention during the conversation
 - e. stand at attention, salute when in uniform, address the person by rank and surname, remain at attention during the conversation and salute when leaving
 - f. stand at attention in the doorway and salute, remain at attention; enter only when told to do so. When leaving, stop at the door, come to attention and salute

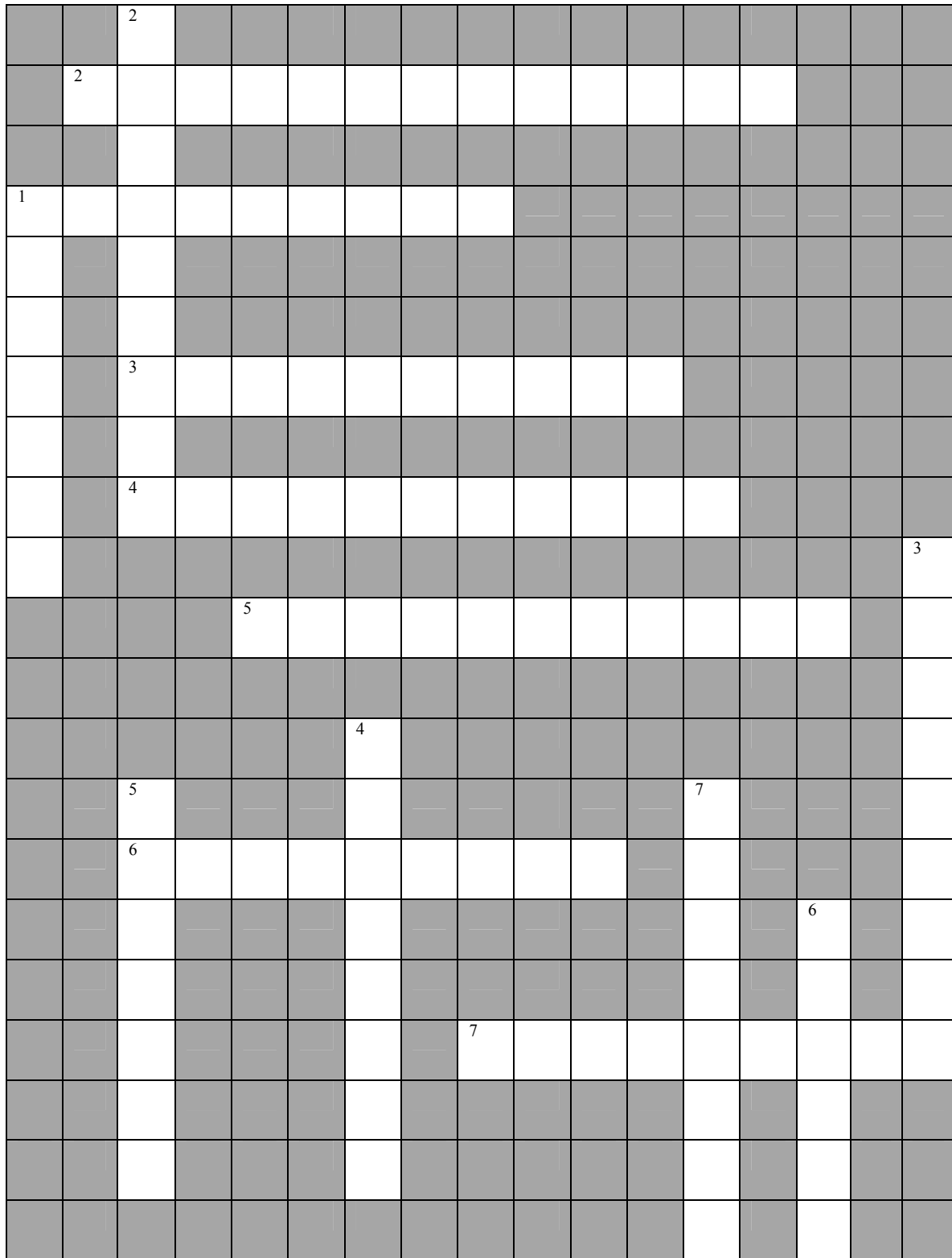
ARMY CADET HISTORICAL DATES MAZE

Use the year in which each of the following events happened to chart your way through the maze

- a. drill associations/ Oldest continually serving corps started
- b. Militia General Order 18
- c. Term “cadet corps’ first appeared
- d. First authorized attachment of cadet corps to militia unit
- e. current numbering system to identify cadet corps established
- f. cadre of commissioned officers formed
- g. Lord Strathcona Trust set up
- h. Army Cadet leaders directed to develop patriotism and good leadership in cadets
- i. His Majesty King George VI conferred title “royal” to cadets
- j. Queen Elizabeth II authorized new design for RCAC crest including motto “Acer Acerpori”
- k. Day to day control of cadet was passed to functional commands
- l. Females allowed to join
- m. New uniform to match post unification Army uniform issued to cadets
- n. His Royal Highness Prince Phillip Presented RCAC Banner
- o. Enrolment age was returned to 12
- p. Army Cadet program was updated with adventure and challenge as the principle elements of Army Cadet training



Crossword Puzzle (Citizenship)



ACROSS

1. A type of government in which a few people have power _____
2. Who is Canada's head of state?
3. A level of government in Canada, which is responsible for such areas as education, child welfare, highways and health care.
4. A branch of the federal government, which is the law making part of the government
5. The type of totem pole that carries a story about the deceased is called _____
6. A branch of the federal government, which consists of the Governor General, the cabinet and the public service
7. A type of government in which control is vested in the population _____

DOWN

1. The official version of this song was proclaimed on 1 July 1980.
2. A level of government in Canada, which is responsible for such things as zoning bylaws, street maintenance, community services and municipal taxes.
3. A type of government in which one person has absolute leadership is called _____
4. A stone representation of the human form which are used as landmarks for hunters and travelers are called _____
5. A level of government in Canada that is responsible for citizenship, foreign policy, postal services, defense and currency
6. The _____ attained official status as an emblem of Canada on March 24, 1975.
7. A branch of the federal government, which deals with the supremacy of law.

UNIT 1 ASSIGNMENT

1. The placement of the Star level badge goes on the right sleeve. What is the measurement of where the Star Level badge should be placed from the bottom of the sleeve?
 - a. 6 cm
 - b. 8 cm
 - c. 7 cm
 - d. 5 cm

2. Which of the following is not one of the aims of Cadets.
 - a. Develop in youth the attributes of good citizenship and leadership
 - b. Stimulate the interest of youth in the Canadian Forces
 - c. To introduce cadets to music, marksmanship and biathlon
 - d. Promote physical fitness

3. What is an NCM
 - a. New-Commissioned Member
 - b. Non-Commissioned Member
 - c. An officer
 - d. None of the above

4. What is the highest rank an NCM can achieve?
 - a. RSM
 - b. Master Warrant Officer
 - c. General
 - d. Chief Warrant Officer

5. Do you salute NCM's?
 - a. Yes
 - b. No

6. Which of the following times do you not salute
 - a. When a Foreign National Anthem is played
 - b. When you are in ranks, and the national anthem is played
 - c. Canadian National Anthem is played
 - d. Cadets flags are paraded

7. Which medal is awarded to the cadet who has demonstrated superior commitment to their corps and community?
 - a. Cadet Award for Bravery
 - b. Lord Strathcona medal
 - c. Royal Canadian Humane Association Medal
 - d. Royal Canadian Legion Cadet Medal of Excellence

8. What level do the cross rifles and crown badge within the Cadet shooting program represent?
 - a. Marksman
 - b. Distinguished Marksman
 - c. First Class Marksman
 - d. Expert Marksman

9. What was the date the Royal Canadian Army Cadet Banner presented?
 - a. 20 Aug 1985
 - b. 15 Feb 1980
 - c. 9 Mar 1895
 - d. 5 Dec 1985

10. Which date is recognized as the official date females could join cadets?
 - a. 25 Sept 1965
 - b. 4 Nov 1970
 - c. 18 Sept 1973
 - d. 30 July 1975

UNIT 2 BUSHCRAFT

1. This unit should take you three hours to complete. Start by completing quiz 1 and then mark it, using the marking guide at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80%, you should complete all the reading, activities, and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 3-2 to 3-38
- b. Army Cadet Reference Book, Pages 3-46 to 3-53
- c. Army Cadet Reference Book, Pages 3-59 to 3-98

3. Activities and Exercise:

- a. Complete Unit 2 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit 2 Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Activity A & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.
- b. Complete Unit 2 – Activity A, then check your answers.
- c. Complete Unit 2 – Activity B, then check your answers.

4. Unit 2 Assignment: This unit's assignment is a 20 question multiple-choice quiz. The questions are very similar to the type you will find on the Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 25 questions from this section on the written exam.

QUIZ 1

1. When selecting personal clothing and equipment, moisture management is an important part of the selection process. List three of the five recommended ways you can manage moisture when choosing the appropriate clothing for an expedition.

- a.
- b.
- c.

2. In a few sentences, describe the difference between a rectangular style sleeping bag, and a mummy style sleeping bag.

3. What is a Quinzhee?

- a. an improvised shelter between two trees, with a thatched roof
- b. a type of compass
- c. a snow shelter made from a large snow drift
- d. a simple snow shelter made from any type of snow, packed 2m high

4. What method of judging distance involves comparing an object to its surroundings, avoiding optical distractions?

- a. halving method
- b. unit average method
- c. appearance method
- d. bracketing method

5. Describe two advantages and two disadvantages of an internal frame rucksack (backpack).

Advantages

- a.
- b.

Disadvantages

- a.
- b.

6. In an emergency/survival situation you should apply the principles applied to the acronym STOP. What does this acronym stand for? Describe each principle.

S –

T –

O –

P –

7. Which of the following is NOT a principle of axe safety?

- a. being a safe distance from other people
- b. using one hand on the axe
- c. do not aim it at your foot
- d. make sure the axe head is on securely

8. When forecasting weather using the wind, which of the following does NOT mean a change in weather for the worse.

- a. winds change in a clockwise direction
- b. winds from the east, increasing in speed
- c. winds change in a counter clockwise direction
- d. winds from the south, increasing in speed

9. In the space provided, draw/write the following ground to air signals.

Require a Doctor

Need Map and Compass

Unable to Proceed,
Require Help

10. When preparing yourself to go on an expedition, what are some important questions you should ask yourself before you leave?

- a.
- b.
- c.
- d.

Summary of Important Points from the Reference Book Bushcraft

Select Personal Clothing and Equipment

- weather and seasonal considerations will impact your choices
- clothing must protect you from sun, wind, rain, snow, various temperatures, insects
- remember to use C-O-L-D
- there are two categories of equipment
- items to carry in your pocket include: whistle knife, identification, compass, survival kit
- sleeping bag must be the correct size, have the proper insulation for the coldest temperature, breathable, have a good zipper
- sleeping bags come in three styles
- sleeping pad for appropriate type of activity, several designs

Pack and Carry Individual Clothing and Equipment

- various load carrying devices such as: backpack (rucksack), webbing, canoe pack, barrel, pack board and tumpline
- external frame backpacks (rucksack) have adaptable components, can carry large objects, does not press against your back, will raise your center of gravity
- internal frame backpacks (rucksack) mold to the shape of your back, easy to pack, lack of projections, ventilation is restricted
- make sure to wear the rucksack properly, shoulder straps and hip belt are properly fastened
- follow the general rules for packing a rucksack

Apply the Principles of Safe Tool Craft

- store tools in a secure space
- use the right tool for the task at hand
- when using a saw, use steady strokes
- when using an axe, secure the target in a safe manner

Assemble a Survival Kit

- will the container float? is it waterproof? sturdy?
- a survival kit will reflect the needs of the user
- might include items such as: matches, snare wire, mirror, fishing gear, emergency blanket
- remember S-T-O-P in an emergency

Discuss the Principles of Outdoor Cooking

- finding safe drinking water, always bring it to a boil, then cool it before drinking or use a water purifier
- outdoor cooking, eat as healthy as possible
- food can be boiled, cooked over a fire, fried, smoked, dried

Construct a Shelter

- you need to have protection from wind, precipitation and sunlight
- avoid overhead hazards, be 100m from cooking area and 100m from open water, 10m from a trail/path/road
- easiest improvised shelter is an “A” frame, using 2 trees about 7m apart, ground sheets and string

Follow Camp Routine and Discipline in the Field

- good personal hygiene in the field will protect you from illness, keep yourself and your clothing clean
- wash yourself daily and keep your hair clean
- go to the washroom regularly
- treat injuries properly
- safety regulations, routine and discipline, there are general rules that apply at all times called SOP's

Discuss Natural Hazards

- poison ivy is most common poisonous plant
- biting and stinging insects are the most common hazard and may cause anaphylactic shock in some people
- nuisance animals are common, don't feed them, keep food sealed and hang it well away from your shelter
- bites from animals are rarely harmful, although some may cause rabies (wolves, bats, skunks)
- Hypothermia is the rapid lowering of the bodies core temperature
- in cold weather be aware of the risk of frost bite
- Hyperthermia is the rapid raising of the bodies core temperature and has two general stages (heat exhaustion, heat stroke)
- in hot weather be aware of the UV index and risk of sun burn
- water is essential to survival, drink water all the time (even in winter) to avoid dehydration
- when you notice a thunderstorm approaching, stop what you are doing and ensure your safety
- when traveling at night, ensure that you can see your terrain

Demonstrate Concern for the Environment

- minimum impact camping, leave behind no trace you have been there, or passed through the area
- use popular areas and trails to avoid further damage to an area
- anything (garbage) you bring in with you, take out with you also
- travel in small groups when ever possible
- in small groups establish one sit holes, and in large group establish a latrine area
- when depositing wash water with soap, make sure to dispose of it at least 100m from any ground water source

Maintain Section Equipment

- routine maintenance should be carried out before use, or each day, and also before storage
- know the most common problems and repair solutions for the Coleman stove and lantern

Identify a Bivouac Site and all its Various Components

- components of a Bivouac site include: water access, prevailing wind, wash site, sleeping are, POL point, food hang etc.
- the key to a good biv site is planning
- always check for danger
- use a site that is visually pleasing
- keep the site organized, clean and safe
- hang food at least 100m from camp site, 6m from the ground
- hang equipment at least 5m from the ground, 2m from a tree trunk

Observe Hiking Techniques

- foot care, check your feet every hour and change socks as required
- avoid water, keep boots dry
- energy conservation, be well fed, well rested and physically fit
- stretch and warm up before you start
- labored breathing is a sign your working too hard
- use teamwork
- establish a routine of rest stops
- keep team members well spaced
- when walking up a step hill, keep your body straight, walking down a steep hill is as dangerous than walking up
- when crossing obstacles, plan your route before you cross
- do not try and wade through a water obstacle

Prepare for an Expedition

- an expedition is an organized voyage or journey across land or water, with a specific aim in mind
- you must be prepared both physically and mentally
- need a list of kit each person will require, check its serviceability
- need a list of group kit, check its serviceability
- make sure your technical skills are ready
- during the expedition, take a few moments to assess things

Discuss Dangerous Animals

- may encounter black, grizzly or polar bears, avoid their known habitats and plan with them in mind
- do not surprise a bear or feed them
- you can not out run or out climb a bear
- be aware of wildcats, stay in a group with your pack on
- never provoke a large animal (moose elk, cattle)
- report all animal attacks to local wildlife authorities
- poisonous snake, give them space, any bite victim must seek immediate medical attention
- communications, includes the phonetic alphabet, call signs, prowords and specific operating rules

Discuss Survival Psychology and Strategy

- a survival situation is the absence of all, or most, equipment and conditions expected
- the survival priority list: first aid, fire, shelter, signals, water, food
- by neglecting aspects of your mental and physical health you limit your ability to think and act
- psychology of survival, fear: unknown, weakness, discomfort, being alone, the dark, animals
- seven enemies of survival: pain, cold, thirst, hunger, fatigue, boredom and loneliness
- have a positive attitude for survival
- team behavior in survival is essential, organization, moral, reaction speed will increase chances
- always set out emergency signals, rely on visual and sound
- ground to air signals are very useful (require a doctor etc)

Predict a Change in Weather

- air pressure, the force air exerts on an object
- warm fronts, more stable than cold, less severe and longer lasting
- cold fronts, more unstable than warm, very active
- occluded fronts, where one air mass is caught between two others
- cloud formations: cirrus, cumulus, cirrocumulus, fair-weather cumulus, cumulus congestus, altocumulus etc.
- forecasting weather from clouds, when weather is getting worse, clouds will thicken, join together and lower in elevation
- wind can also be used to forecast weather
- make notes in a journal morning, noon and night to track weather changes, but still use local forecasts and common sense

Judge a Distance

- unit of measure method, estimating other distances based on your 'unit' of measure (commonly 100m)
- appearance method, study something compared to its surroundings
- halving method, judge a fraction of the total distance
- bracketing method, average of two estimates
- unit average method, get many people to estimate the distance and take the average of the group

Construct an Improvised Shelter

- there are five different types of improvised shelters
- there are four different types of snow shelters

UNIT 2
SUPPLEMENTAL READING

**Why Objects Seem Closer
Than They Really Are**

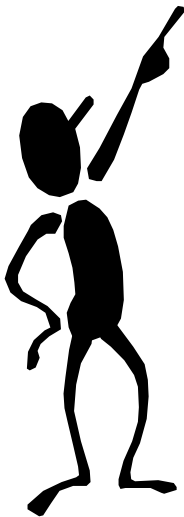


- a. Light
- b. Colour
- c. Similarity
- d. High Altitudes
- e. Dead Ground
- f. Size

404.02 Silver Star

OHP 3

**Why Objects Seem Farther
Than They Really Are**



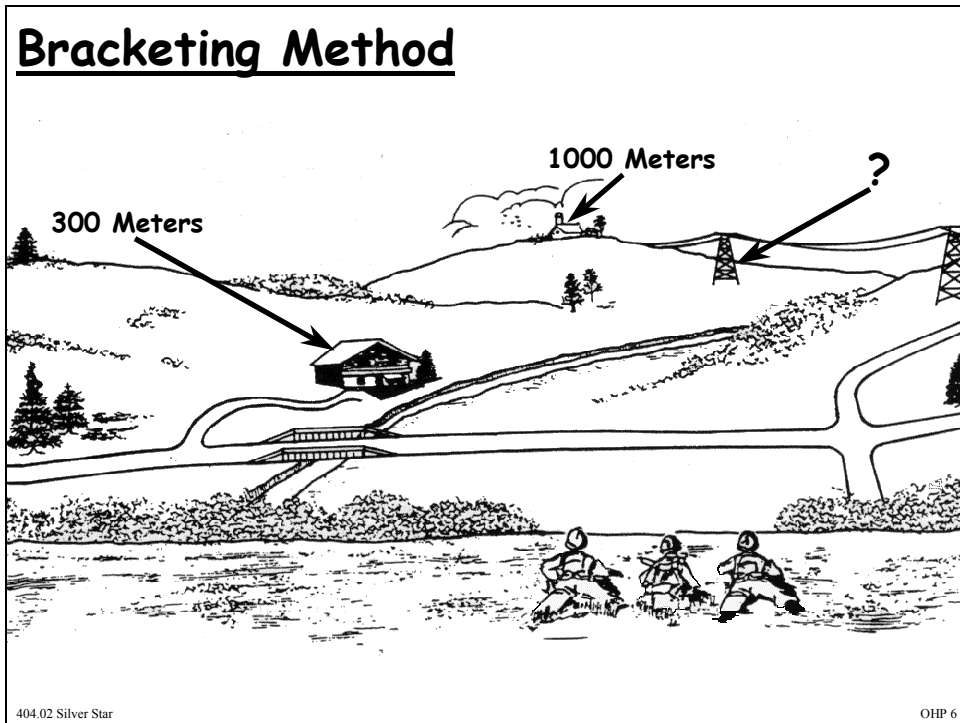
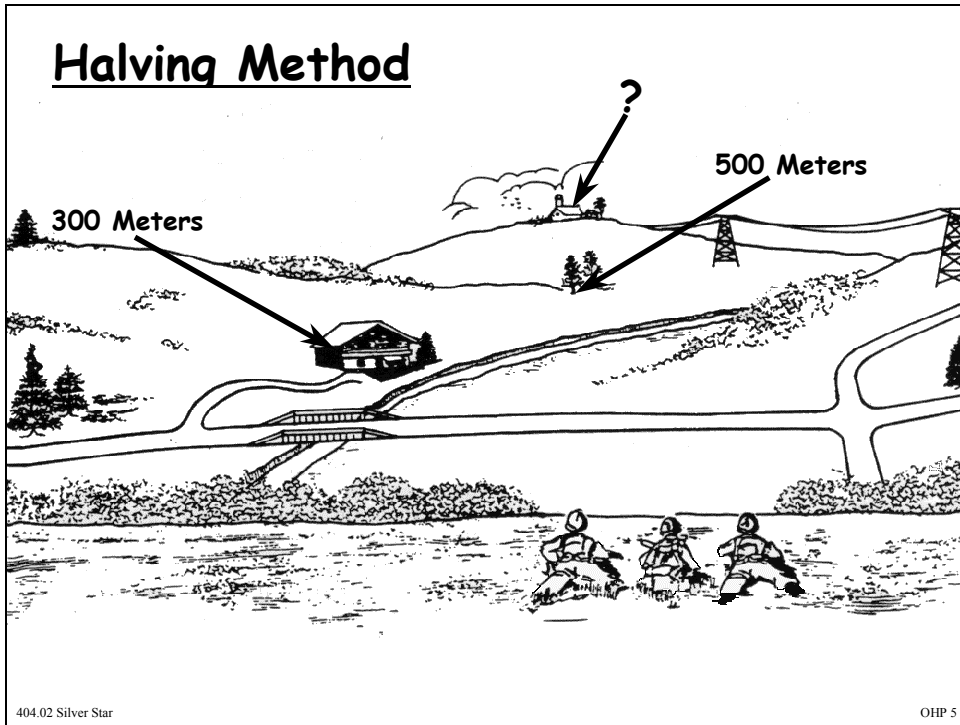
- a. Poor Light
- b. Partial Visibility
- c. Optical
- d. Merge
- e. Size
- f. Observer

404.02 Silver Star

OHP 4



The overhead slides in this section come from the Master Lesson Plans. There are many excellent OHPs prepared. Whether you are teaching a lesson at your corps or at NSCE, check to see if there are some you can use. Go to www.



Unit Average Method

100 Meters
150 Meters 80 Meters
110 Meters

100 Meters

150 Meters

80 Meters

404.02 Silver Star

OHP 7

WATER

The Minimum Daily Requirement is Two Cups or 1/2 Liter Per Day

403.02 Red Star

OHP 1



Rainwater

Condens

Snow

Ice

*All Water
Must Be
Purified*

403.02 Red Star OHP 2

S - Sharpen All Tools

T - Test All Equipment

O - Oil All Metal Tools

R - Remove All Dirt

E - Equipment Must Be Dry

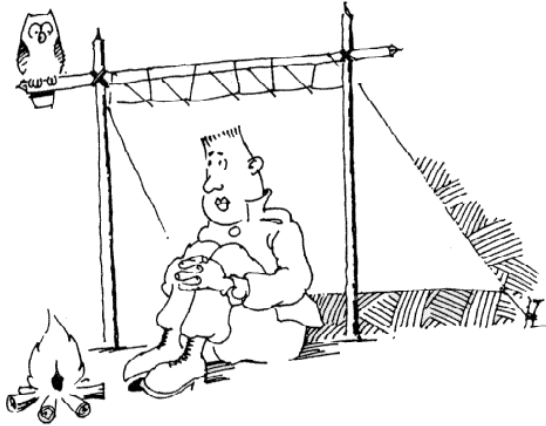


403.02 Red Star OHP 3

Selecting a Bivowac Site

Always Look for

- * Well Drained Ground
- * Safe Surroundings
- * Dangerous Plants
- * Pure Water



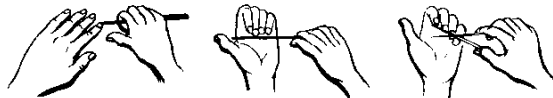
403.07 Red Star

OHP 1

WASHING WHERE & WHEN



- SKIN ----- (daily)
- HANDS ----- (before meals/after latrines)
- FINGERNAILS ---- (before meals)
- HAIR ----- (once a week)
- TEETH ----- (after meals)
- FEET ----- (daily)



403.02 Green Star

OHP 1

ACTIVITY A

Fill in the blanks from the list below to complete these sentences. Use each answer only once.

1. The most common economical sleeping bag is the _____
2. A sleeping bag that is a compromise between the efficiency of the mummy design and the economy of the rectangular bags is the _____
3. The disadvantage of this type of mattress is that they are easily damaged and take a long time to prepare for use and storage. It is an _____
4. Another name for the load bearing vest which is used primarily by military forces is _____
5. The warmest of all sleeping bag styles is the _____
6. This item is an excellent pack for climbing and mountaineering where a range of motion and lower center of gravity are important. It is a _____
7. This item is an excellent pack for novice trekkers, and for carrying heavy loads over worn trails and fairly level terrain. It is the _____
8. What part of the rucksack takes most of the weight? _____
9. There is an acronym which describes the action you should take if you ever become lost when you are hiking. What is it? _____
10. What is something that you should always carry on your person when you go into the bush? _____
11. The easiest improvised shelter is the _____
12. The most common poisonous plant in Canada is called _____
13. The most common hazard for nature enthusiasts in Canada is _____
14. The rapid lowering of your body's core temperature is called _____
15. The term used to describe the rate of heat loss on the body resulting from the combined effect of low temperature and wind is called _____
16. Untreated heat exhaustion symptoms will get worse and lead to _____
17. What is the best drink to use to replenish your dehydrated body _____
18. Fire requires three components to burn, fuel, oxygen and _____

rectangular bag	air mattress	rectangular bag	webbing	heat
mummy bag	internal frame pack	hip belt	STOP	
survival kit	poison ivy	insects	external frame back pack	
A frame	Hypothermia	wind chill	heat stroke	water

Decode the scrambled letters to name the seven enemies of survival

N A
I P

19. _____

D C
L O

20. _____

T T H
S R I

21. _____

G H N
R U E

22. _____

F E U I
T G A

23. _____

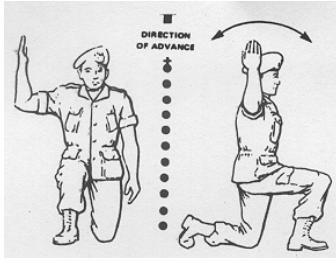
S S L
L O E I
E N N

24. _____

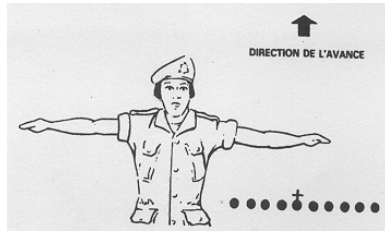
R B O M D O

25. _____

26. Write the name of the field signal under the appropriate picture.



a) _____



b) _____



c) _____



d) _____



e) _____



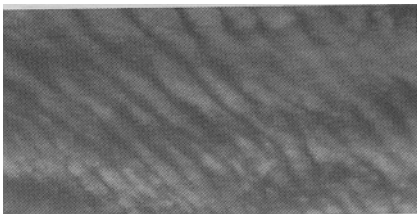
f) _____

27. Using the list of clouds below, write the name of the cloud under the matching picture of the cloud formation.

- a. Cumulus – detached clouds in the form of white, delicate filaments
- b. Cirrocumulus – high level heap clouds
- c. Fair Weather Cumulus – low level clouds, not very dense
- d. Cumulus Congestus – high level clouds formed by a massive uplifting of heated air
- e. Altocumulus – medium level, puffy clouds









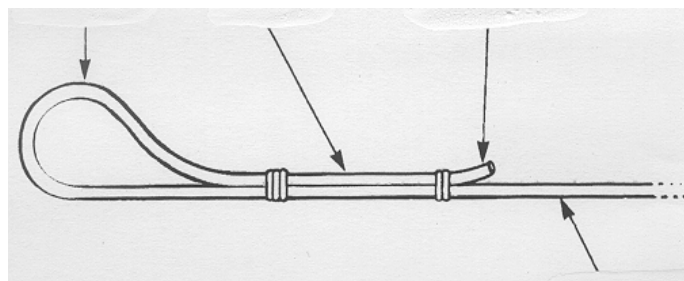


28. Write the phonetic name for each letter of the alphabet, or number, underneath the appropriate letter or number inside the boxes.

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X
Y	Z	1	2	3	4
5	6	7	8	9	0

29. Below you will find a picture of a rope. From the list provided, label the four parts of a rope. Some of the answers may not be used.

- a. Bight
- b. End
- c. Thumb knot
- d. Whipping
- e. Clove Hitch
- f. Standing part



ACTIVITY B

1. When selecting personal clothing for an expedition, you should keep in mind the acronym COLD. What does this stand for?

C -

O -

L -

D -

2. In order to properly manage your equipment for an expedition, you must divide it into two categories, one of which is objects you carry in your pockets. List any four of the nine items commonly carried in the pocket.

a.

b.

c.

3. a) What is the definition of a Survival Situation?

b) Write down (in order) the survival priority list, and give a small description of each one.

i.

ii.

iii.

iv.

v.

vi.

4. Which knot is used to anchor a rope around a tree trunk, pole or other such item? This knot is also easy to undo and will not slip.

- a. Figure Eight
- b. Reef
- c. Double Figure Eight
- d. Bowline

5. Being able to judge distance *without* an electronic aid is an important skill in the field. There are various methods of estimating distance, for example, the _____ method is used by saying to yourself “The object is at least ‘X’ units away but is not ‘Y’ units away.” What method of judging a distance is this?

- a. The appearance method
- b. The halving method
- c. The bracketing method
- d. The unit average method

6. In survival, and field expedition situations, it will be fitting in many circumstances to construct an improvised shelter. There are five recognized types of improvised shelters, list them below.

- a.
- b.
- c.
- d.
- e.

UNIT 2 ASSIGNMENT

1. When selecting personal clothing and equipment for the field, you should keep in mind the acronym COLD. What does the “L” stand for in COLD?
 - a. lay still
 - b. dress loose and in layers
 - c. wear less cloths
 - d. loose leather

2. Which of the following is NOT a basic style of sleeping bag?
 - a. rectangular
 - b. mummy
 - c. military
 - d. barrel

3. A general rule for packing a rucksack is to avoid carrying more than _____kg so as not to injure you shoulders.
 - a. 25kg
 - b. 16kg
 - c. 5kg
 - d. 30kg

4. In applying principles of safe tool craft when using an axe, shovel, or bow saw, one must...?
 - a. Use any tools for any job
 - b. Use all tools for one job
 - c. Use the right tool for the job
 - d. Leave tools lying around

5. In an emergency/survival situation, you should always think of the acronym STOP. What does the “S” stand for in STOP?

- a. scream
- b. sleep
- c. solar
- d. stop

6. When selecting a wilderness shelter site, to protect yourself and your shelter, you should...?

- a. Avoid depressions where water might pool after rainfall
- b. Place your site on a road or path
- c. Avoid putting the opening of your shelter away from the wind
- d. Place your shelter nearest to the cooking area

7. When you are camping with cadets, there are general rules that apply to you at all times in a bivouac site. These rules and procedures are called what?

- a. CFAOs
- b. SOPs
- c. CATOs
- d. OPs

8. Which of the following is a type of improvised shelter?

- a. tent
- b. ground sheet shelter
- c. chopped tree shelter
- d. cabin

9. Which method of judging a distance requires you to get several of your teammates to judge the distance using their choice of method, and then you taking the groups average.
- group average method
 - average method
 - unit average method
 - halving method
10. Using the clouds it is possible to forecast weather. From the list, which cloud activity will tell you that the weather is going to change for the better?
- clouds moving contrary to the ground wind
 - there is a halo around the moon
 - cumuluous clouds forming in the am and stacking in the pm
 - morning fog burning off before noon
11. Team behavior, in a survival situation, is key to the groups' success. Which of the following is NOT one of the key elements in team survival?
- moral
 - organization
 - emergency signals
 - reaction speed
12. In a survival situation, there are certain things that you will experience, that may threaten your survival if you do not know how they will affect you. These are the seven enemies of survival. Of the lists, what are the correct seven enemies of survival?
- heat, cold, thirst, hunger, fatigue, boredom and loneliness
 - pain, cold, thirst, hunger, fatigue, boredom and loneliness
 - pain, cold, thirst, huger, sleep, boredom and loneliness
 - heat, cold, thirst, hunger, fatigue, loneliness

13. Proper use of radio communications and the phonetic alphabet are important in the field. To aid in security, call signs are given to certain positions. What is the call sign for the commander?

- a. sunray
- b. sunray minor
- c. starlight
- d. zero

14. In the set up of a bivouac site, your sleeping area should be _____m from the kitchen area, as well as the food hang.

- a. 10m
- b. 100m
- c. 1000m
- d. 50m

15. Which knot is often called the rescue knot, and makes a loop that will not slip?

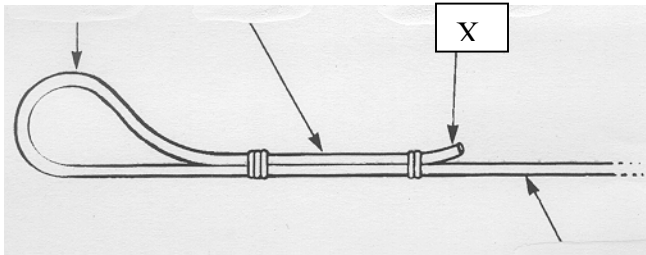
- a. fisherman's
- b. figure eight
- c. bowline
- d. thumb

16. What is the field signal in the picture?



- a. turn around
- b. halt
- c. double time
- d. join me

17. In the following diagram of a rope, what is the part of the rope labeled “X”?



- a. bight
 - b. end
 - c. whipping
 - d. standing part
18. What is the most common poisonous plant in Canada?
- a. poison oak
 - b. poison ivy
 - c. poison sumac
 - d. poison rose
19. What is the most severe form of cold-related injury?
- a. heat exhaustion
 - b. hyperthermia
 - c. heat stroke
 - d. hypothermia

UNIT 3 MARKSMANSHIP

1. This unit should take you two hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80%, you should complete all the reading, activities, and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 6-2 to 6-27

3. Activities and Exercise:

- a. Complete Unit 3 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit 3 Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.

- a. Complete Unit 3 – Activity 1, then check your answers.

4. Unit 3 Assignment: This unit's assignment is an 11 question multiple-choice quiz. The questions are very similar to the type you will find on the Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 14 questions from this section on the written exam.

QUIZ 1

1. What are the three *safe* rifle positions?
 - a.
 - b.
 - c.

2. What are the following characteristics of the Daisy 853C air rifle?

Action –

Calibre –

Muzzle Velocity –

Safety Catch –

3. List five of the 14 characteristics of a good position
 - a.
 - b.
 - c.
 - d.
 - e.

4. Which of the following is NOT an aiming technique?
 - a. Eye relief
 - b. Sight alignment
 - c. Proper head position
 - d. The master eye

5. Good trigger control involves which of the following?
 - a. position of the trigger finger
 - b. position of the hand on the head
 - c. prone position
 - d. position of the middle finger

6. Which knob sits on top of the sight and moves the point of impact up or down on the target?
 - a. windage knob
 - b. elevation knob
 - c. sight knob
 - d. adjustment knob

7. In order to aim lower when firing in a standing position, you must...?
 - a. widen your stance, pull left hand back, vary the left hand position
 - b. reduce width of stance, push left hand forward, vary left hand position
 - c. shift feet backwards or forwards
 - d. lower the height at which you are holding the rifle

Summary of Important Points from the Reference Book Marksmanship

Observe Safety Precautions

- firearm safety is the number one priority on or off a range
- the safety catch prevents the rifle from firing by locking the trigger in place
- there are three safe rifle positions: in a rifle case, on the firing line, not on the firing line
- a rifle case should be marked with an arrow on the outside to show which direction the rifle is pointing on the inside
- an individual safety check must be performed to confirm the rifle is safe
- always wash your hands after contact with lead pellets

Identify Parts and Characteristics of the Daisy 853C rifle

- there are 18 different parts on the Daisy air rifle
- the Daisy air rifle has 12 main characteristics

Load, Fire and Unload the Daisy 853C rifle

- there are very specific steps that must be followed when loading, firing, unloading and pumping the Daisy air rifle – these must be adhered to and followed at all times

Adopt the Prone Position and Holding the Rifle

- a good positioning marksmanship is restful and relaxed
- objective of prone position is to obtain a uniform and stable platform for steady aiming
- weight should be equally distributed through out the body

Discuss the Principles of Marksmanship

- the five principles of marksmanship are: position, holding the rifle, aiming, breathing and trigger control
- master eye, one eye that is stronger than the other, used to aim
- there are five different elements to good aiming technique
- do not hold your breath more than 5-7 seconds
- follow the recommended breathing sequence
- trigger control involved, position of the hand on the rifle, position of the trigger finger, and squeezing the trigger
- a sling helps to support the weight of the rifle, if too loose will no longer provide support
- natural alignment when a rifle is aimed at a target without being muscled into doing this
- there are two sight alignments, elevation and windage
- three main reasons for a proper follow through

Fire the Daisy 853C rifle in the Standing Position

- standing position to the easiest and quickest position to assume
- to compensate for the weight of the rifle you must bend your back to the right and rearward (opposite for left shooters)
- there are eight characteristics to a good standing position, including having your hips 90° to the target and facing to the right
- to compensate for movement when using the standing position, there are steps you can follow to aim higher, aim lower, and further to the left or right
- same breathing and trigger control techniques of the prone position, apply when standing
- the same load, fire, and unload are also the same as when using the prone position, however there are now two options for pumping the rifle

Observe Duties and Responsibilities of Range Personal

- know what the range safety officer is responsible for
- know some common duties for range assistants
- know why a range must be inspected before firing
- coaching is one of the most important duties of a range assistant
- as a coach you should know your firing point sequence, how to call the shots, how to use the clock system, and how to analyze targets
- know all range commands and procedures
- know how to deal with all immediate action and stoppages
- know how to properly clean the parts of the rifle with the appropriate cleaning supplies

ACTIVITY 1

Answer the questions below by finding the them in the word search.

S	I	G	H	T	A	L	I	G	N	M	E	N	T	F	T	A	G	S	F
W	E	I	G	S	M	A	S	T	E	R	E	Y	E	N	E	C	O	E	B
F	E	A	R	B	E	R	E	T	S	F	E	A	E	E	Y	R	S	E	S
R	I	F	L	E	S	D	E	R	J	K	G	M	D	E	A	R	L	R	I
P	U	M	P	I	N	G	M	N	V	L	N	L	A	E	E	R	I	T	G
B	G	M	U	Z	Z	L	E	I	O	G	L	M	A	L	L	E	N	T	H
R	P	O	U	L	R	T	E	A	I	M	E	R	L	E	A	D	G	L	R
E	R	S	W	G	A	G	E	L	T	R	Y	F	Y	Y	O	U	R	O	B
A	O	H	A	G	O	B	A	A	I	M	I	N	G	E	A	S	D	R	N
T	A	A	S	S	H	L	W	E	R	R	R	T	Y	R	E	A	W	T	M
H	G	H	H	H	A	C	E	S	E	W	P	S	P	E	P	O	L	N	A
I	N	R	I	R	A	F	E	H	L	H	I	Y	T	L	Y	P	O	O	S
N	E	W	U	R	M	N	T	M	B	A	X	G	U	I	N	G	P	C	D
G	Q	T	T	U	Q	G	W	U	D	E	A	S	D	E	O	N	P	R	Q
E	A	R	G	J	N	M	M	J	V	F	E	L	P	F	I	I	I	E	U
N	E	F	N	I	M	W	E	I	U	K	I	R	E	U	T	K	O	G	P
E	D	V	D	O	J	E	K	U	A	S	F	V	I	U	I	A	Q	G	L
T	C	L	W	I	N	D	A	G	E	K	N	O	B	Y	S	C	U	I	M
S	O	T	B	L	U	F	I	O	L	U	I	O	P	K	O	B	I	R	B
H	A	S	A	F	E	T	Y	C	A	T	C	H	A	S	P	Y	T	T	S

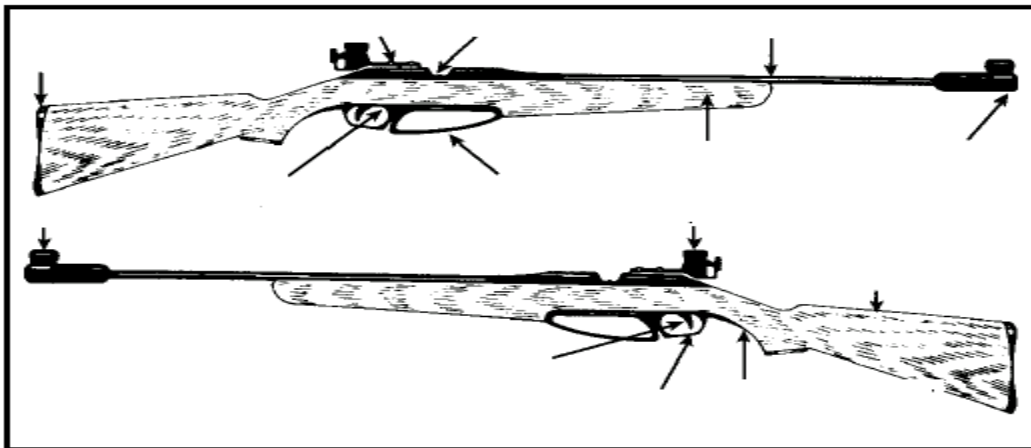
1. The five principles of marksmanship are: _____, _____, _____, _____, _____.
2. The mechanism that once engaged prevents the rifle from firing by locking the trigger in place is called the _____.
3. Handling pellets can leave a trace of _____ on your hands so it is important to _____ them thoroughly after any contact with pellets.
4. The front end of the barrel with attachable barrel weight is called the _____.
5. The air rifle used in the cadet marksmanship program is the _____ 853C.
6. Everyone has one eye which is stronger than the other, this is called the _____.
7. The distance between your eye and the rear sight is called _____.
8. The most critical element of the aiming process is _____ which refers to the alignment of the eye, the rear sight and the front sight.
9. The _____ helps to support the weight of the rifle ensuring minimal muscular effort on the part of the shooter.
10. _____ is obtained when the rifle can be perfectly aimed at the target without being muscled into position.
11. The _____ moves the pellet impact on the target sideways on the target.
12. _____ results when residue from the compression chamber air blown into the bore condenses in the barrel.

Eye relief	Sight Alignment	Position	Safety Catch
Wash	Daisy	Breathing	Muzzle
Lead	Aiming	Master Eye	Natural Alignment
Trigger Control	Sling	Holding The Rifle	Windage Knob
Caking			

PARTS OF THE DAISY

Unscramble the following words and then label the parts of the Daisy 853C indicated by the arrows.

- | | |
|-------------------------|---------------------------|
| 13. kcots - _____ | 14. earr gthis - _____ |
| 15. gergirt - _____ | 16. ggertir ruadg - _____ |
| 17. ntfor tsigh - _____ | 18. tutb telap - _____ |
| 19. ltob - _____ | 20. edef kartc - _____ |
| 21. lerarb - _____ | 22. zelzum - _____ |
| 23. refo den - _____ | 24. ysfeta cchat - _____ |



25. When a pellet is stuck in the barrel, what is the appropriate solution?

UNIT 3 ASSIGNMENT

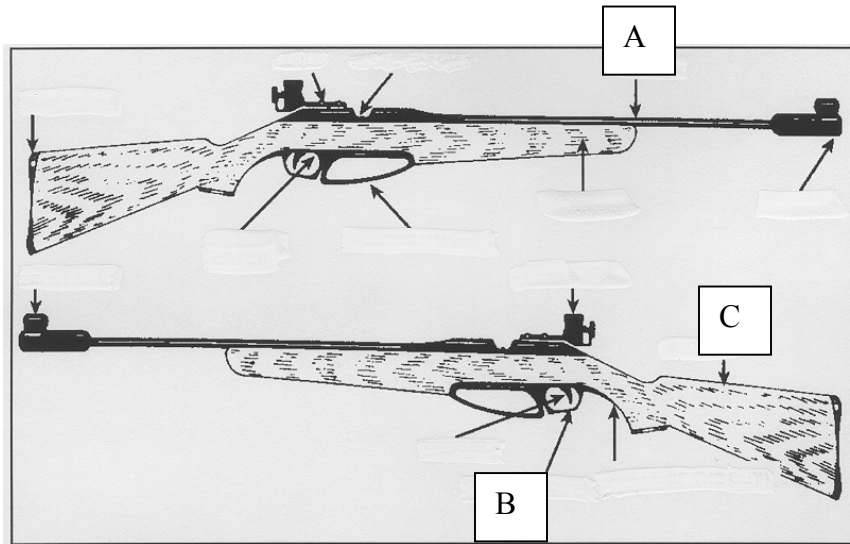
1. When a pellet is incorrectly seated in the chamber of the rifle, what is the proper solution?
 - a. safety off, open bolt, insert safety rod
 - b. safety on, insert safety rod
 - c. safety on, open bolt, insert safety rod
 - d. safety off, insert safety rod, open bolt

2. What is the first step you would take if two pellets were lodged in the barrel or chamber?
 - a. attempt once to fire the pellets out
 - b. attempt twice to fire the pellets out
 - c. safety on, open bolt
 - d. safety off, open bolt

3. When the range command "*relay, cease fire*" is given, what is the action that should follow?
 - a. stop firing, put the safety catch on
 - b. put the safety catch off, and resume firing
 - c. stand up and leave your equipment on the ground
 - d. stop firing, keep the safety catch off

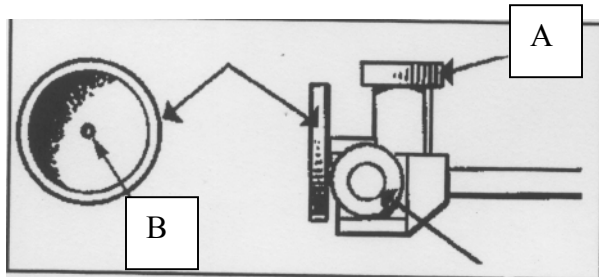
4. After firing, how should the lead pellets be disposed of?
 - a. pick them up and put them in a garbage
 - b. sweep them up and give them to a cadet to take home
 - c. pick them up and put them in a container, and take them to nearest recycle bin
 - d. sweep them up, put them in a container, and treat them as hazardous materials

Use the following diagram to answer questions 5-7.



5. What is part “A” on the diagram of the rifle?
- barrel
 - trigger guard
 - stock
 - fore end
6. What is part “B” on the diagram of the rifle?
- barrel
 - trigger guard
 - stock
 - fore end
7. What is part “C” on the diagram of the rifle?
- barrel
 - trigger guard
 - stock
 - fore end

Use the following diagram to answer questions 8-9.



8. What is part “A” of the sight?
- windage
 - elevation
 - peep site
 - aperture hole
9. What is part “B” of the sight?
- windage
 - elevation
 - peep site
 - aperture hole
10. How do you do a proper individual safety check?
- safety off, open the bolt, pump lever open, insert safety rod
 - open the bolt, safety off, pump lever open insert safety rod
 - open the bolt, safety on, pump lever open, insert safety rod
 - safety on, pump lever open, open the bolt, insert safety rod
11. Which of the following is the NOT on the list of safe rifle conditions?
- in a rifle case
 - out of a rifle case
 - on the firing line
 - off the firing line

UNIT 4 PUBLIC SPEAKING AND LEADERSHIP

1. This unit should take you one hour to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80% you should complete all the reading, activities, and exercised in this unit.
2. Reading:
 - a. Army Cadet Reference Book, Pages 10-1 to 10-8
 - b. Army Cadet Reference Book, Pages 11-1 to 11-53
3. Activities and Exercise:
 - a. Complete Unit 4 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit 4 Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Activity A & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.
 - b. Complete Unit 4 – Activity A, then check your answers.
4. Unit 4 Assignment: This unit's assignment is a 10 question multiple-choice quiz. The questions are very similar to the type you will find on the General Knowledge Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 21 questions from this section on the written exam.

QUIZ 1

1. What are the three P's to public speaking?

2. List five ways a presenter can overcome or avoid stage fright?

3. What does the acronym "TEAM" stand for?

T –

E –

A –

M –

4. What is Morale?

5. What is the Canadian Forces definition of Leadership.

6. What are three styles of leadership?

7. Explain the Persuasive element of the participative style of leadership.

8. List 3 factors that affect human communication.

9. What are the four types of supervision?

10. List five of the seven functions of a supervisor?

11. What does the acronym “SMESC” stand for?

S –

M –

E –

S –

C –

12. When one leads, they tend to lead by example. There are two types of ways one can lead by example; they are deliberate and unconscious. What do they mean?

Deliberate _____

Unconscious _____

Summary of Important Points from the Reference Book Public Speaking

List the Basic Elements of Speech Preparation

- there are three “P”s to public speaking
- personality, made up of attitude, appearance, and voice
- preparation, there are eight important points to remember (ex. select and limit topic)
- presentation, make eye contact with the audience, ask questions, use visual aids

List the Ways in Which to Avoid Stage Fright

- personal appearance
- memorize the opening sentence
- breath deeply
- believe in yourself
- prepare your speech
- pick out a friendly face
- voice (clarity, expression, sound range)

ACTIVITY A

1. There are eight points to consider when preparing a speech, what are they?

2. List eight duties of a team member.

3. What is Esprit De Corps?

4. List five of the ten principles of leadership.

5. What is the Canadian Forces definition of Management?

6. What is the Canadian Forces definition of Command?

7. In what situation would a leader use an authoritative style of leadership?

8. The participative style of leadership has two key elements, what are they?

9. List five barriers that may affect communication.

10. What is immediate supervision and when would it be used?

11. What are the three methods a cadet may use to solve a problem?

12. There are two types of discipline, what are they?

UNIT FOUR ASSIGNMENT

1. Leadership is:
 - a. the art of influencing human behaviour in order to accomplish a task in the manner desired by the leader.
 - b. the science of employing human resources and material in the most economical and effective accomplishment of a task.
 - c. the lawful authority that a superior exerts over their followers by virtue of their rank or appointment.
 - d. all of the above

2. Which of the following is one of the two key elements in a participative style of leadership?
 - a. accomplishment
 - b. development
 - c. goal
 - d. feedback

3. When you give orders you must plan, deliver, confirm and _____.
 - a. correct
 - b. evaluate
 - c. praise
 - d. dismiss

4. What type of supervision is done when the participants are undergoing a planned activity but many not be immediately in view?
 - a. close supervision
 - b. direct supervision
 - c. general supervision
 - d. immediate supervision

5. What type of supervision is done when participants are within your arms length?
 - a. close supervision
 - b. direct supervision
 - c. general supervision
 - d. immediate supervision

6. In solving a problem there are three methods that can be used, dependant on time. Which one of the following is NOT on of those?
 - a. trial and error
 - b. straight analysis
 - c. operations order
 - d. logical analysis

7. In the sequence of task procedure, what is the last step?
 - a. issue your orders
 - b. do the task
 - c. update warning orders
 - d. receive operation orders

8. Which of the following are Canadian values?
 - a. peace
 - b. equality
 - c. tolerance
 - d. all of the above

9. What year was the Canadian Human Rights Act introduced?
 - a. 1981
 - b. 1977
 - c. 1944
 - d. 1895

10. What year was the Canadian Charter of Rights and Freedoms introduced?
 - a. 1981
 - b. 1978
 - c. 1984
 - d. 1988

UNIT 5

Map & Compass

Introduction to map using and Conventional Signs

1. This unit should take you one hour to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80%, you should complete all the reading, activities, and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 5-1 to 5-13
- b. Additional Reading (included): Government of Canada
Website: <http://maps.nrcan.gc.ca/maps101/>
 - i) Mapping Terminology
 - ii) Tips and Hints
 - iii) Topographic Map Symbols
 - iv) Map Scale
 - v) What are Contours
 - vi) The National Topographic System

3. Activities and Exercise:

- a. Complete Unit 5 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.
- b. Complete Unit 5 – Quiz 2, then check your answers.

4. Unit 5 Assignment: This unit's assignment is a 10 question multiple-choice quiz. The questions are very similar to the type you will find on the Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



The webpage listed is a very good resource and has much more information than is listed here. Those who want a better understanding of this material are encouraged to visit the site and follow its links.



You can expect to find 16 Map and Compass questions on the written exam.

QUIZ 1

1. Circle any correct statements.
 - a. The trouble with maps is that you cannot depend on the scale to measure the same distance in various parts of the map.
 - b. On the ground, you have length, width and height, but a map is flat, like a photograph of the ground taken from an airplane straight overhead.
 - c. A map represents the surface of the earth as though it were flattened out and the features on it are drawn in proportion so they can be located and identified.
 - d. A map would be greatly improved if the features and buildings represented on it were the same size as they really are on the ground.

2. The symbols used on the map to portray objects or features are called what?

3. A system of strip projection which is used by all National Topographical System maps is called _____

4. If the scale of a map was 1:50 000, what ground distance would be represented by 5 cm on the map?

5. Conventional signs are coloured according to their category. What colour is used for:
 - a. paved roads
 - b. contour lines
 - c. permanent ice features and water.

Summary of Important Points from the Reference Book

Introduction to map using and Conventional Signs

Types of Maps

- a map is a picture of the ground as though looked at from above
- map reading aims to illustrate certain information or to serve a purpose for the user
- types of maps include: political, street and road, statistical, digital, relief, outline, topographical, orienteering, air

Map Scale

- all maps drawn to scale in the modern era
- expression of the ratio between ONE UNIT on the map to the scale distance on the GROUND e.g. 1:50,000 (most common ratio that we use in Cadets) therefore, if we measure in cm's:
1 cm on the map would 50,000 cm (500 m) on the ground.
2 cm on the map would be 1000,000 cm or 1000m or 1 km

Folding a Map

- maps are always folded accordion style, in the shape of an “M”

Topographical Maps

- is the most common map used in Cadets

Conventional Signs

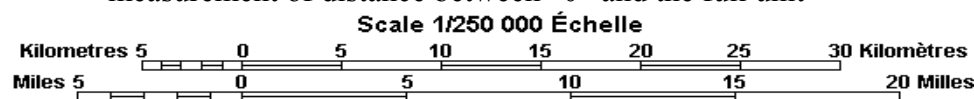
- are the symbols and colors that represent all the different objects and features that can be found in the area which the map represents

Map and Compass Terms

- note that there are many common terms used in map reading, be familiar with all of them as any of them may be on the test (refer to the reference book and attached additional readings)

Marginal Information

- know where the Map Scale is (e.g. 1:50,000) and what it is used for
- remember to use the right scale for the unit you want to measure
Note: the “0” measurement starts after the tenths units. You would start your distant measurement at this point, and that the left hand end of scale bar marked into tenths for a more accurate measurement of distance between “0” and the full unit



↑ **NOT** here



*Can you think of a question for each of these headings?
Make sure you can answer questions from each area.*



Make sure you use the correct scale bar and start from 0.

ADDITIONAL READING

MAPS 101 TOPOGRAPHICAL MAPS, THE BASICS

<http://maps.nrcan.gc.ca/maps101/>

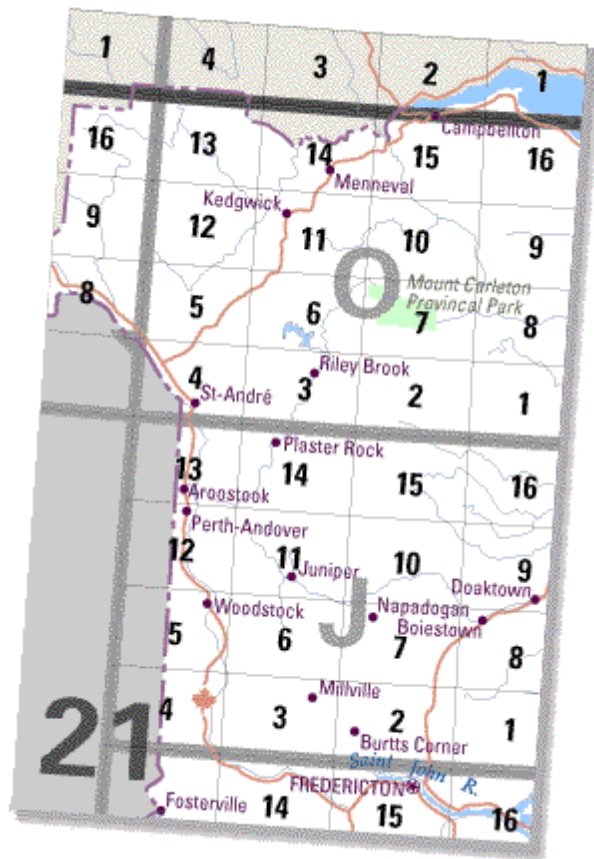
National Topographic System Index Maps

New Index Maps

We have recently developed the following series of six regional Index Maps showing the National Topographic System grid:

- Atlantic Provinces CTI-11 (pictured below)
- Quebec CTI-12
- Ontario CTI-13
- Prairie Provinces CTI-14
- British Columbia CTI-15
- Northwest Territories and Yukon CTI-16

These index maps are available from map dealers and [Regional Distribution Centers](#) across Canada.



How are NTS map sheets defined on our new Index Series?

Each area defined by dark grey lines is given a dark grey number ($^{\circ}21^{\circ}$, in the diagram). This is the first element in an NTS map number.

This dark grey extent is divided into 16 smaller areas defined by lighter grey lines; each of these 16 areas is labeled with a light grey letter ($^{\circ}O^{\circ}$ and $^{\circ}J^{\circ}$, in the diagram). The lettering begins in the southeast (lower right-hand) corner and zigzags to the northeast (upper right-hand) corner. The letter is the second element in an NTS map number for a 1/250 000 map. This lighter grey extent is divided into 16 areas defined by fine black lines; each of these 16 areas is labeled with a black number ($^{\circ}1^{\circ}$ to $^{\circ}16^{\circ}$). The numbering begins in the southeast (lower right-hand) corner and zigzags to the northeast (upper right-hand) corner. This is the final element in an NTS map number for a 1/50 000 map.

Note that certain maps do not conform to the regular NTS grid. These non-conforming maps have extended or reduced limits to accommodate the extent of the landmass and maintain contiguous areas. Reduced limits remove large extents that show only water and preserve areas that show land. Non-

conforming maps help make the National Topographic System more efficient. Generally, non-conforming map sheets can be identified by their irregular lines on the grid; however, some non-conforming 1/250,000 maps are identified by a light/dark pattern of lines and repositioned labels.

Mapping Terminology

Bearing	The horizontal angle at a given point, measured clockwise from magnetic north or true north to a second point.
Classified roads	Roads for which surface type, width and use are identified.
Contour lines	Lines on the map connecting points of equal elevation above mean sea level; using contour lines, relief features can be profiled into a three-dimensional perspective.
Elevation	Vertical distance from a datum (usually mean sea level) to a point or object on the earth's surface.
Magnetic declination	The angle between magnetic north and true north, expressed in degrees and minutes, east or west from true north.
Magnetic north	Direction to which a compass needle points.
Mean sea level	The average height of the surface of the sea for all stages of tide, used as a reference surface from which elevations are measured.
Projection	Geometric representation of the curved surface of the earth on a flat sheet of paper.
Relief	The physical configuration of the earth's surface, depicted on a topographic map by contour lines and spot heights.
Spot elevation	A point on a map where height above mean sea level is noted, usually by a dot and elevation value; it is shown wherever practical (road intersections, summits, lakes, large flat areas and depressions).
Surveying	The operation of taking observations or measurements to determine geographic location.
Topography	Surface features both natural and cultural, collectively depicted on topographic maps.
True north	Direction of the northern rotational axis of the earth - the North Pole.
Unclassified roads	Roads for which the surface is unidentified.

Maps 101 - Topographic Maps, The Basics

Tips and Hints

Know what map **scale** you are using in order to measure distance. Refer to the **scale bar** at the bottom of the map.

1/50 000 scale: 1 cm = ½ km

1/250 000 scale: 1 cm = 2½ km

A **legend** explaining the **symbols** used is provided on the back of a National Topographic System (NTS) map for easy reference.

Using a **compass** along with a topographic map ensures an exact direction for locating features. An approximate but quick way to orient your map is to align the compass needle (when it is pointing north) with the top of the map. Remember that **north** is always at the **top** of an NTS map.

A map is **oriented** when it is made to correspond to the ground features it represents. If you know your location and can also identify the position of a distant object, you can orient your map by turning it so it corresponds to the ground features.

When allowing for **magnetic declination**, remember: declination west, magnetic best (**add**); declination east, magnetic least (**subtract**).

Use **contour lines** to determine elevations of mountains and flat areas. The closer together the lines are, the steeper the slope. Note that **contour numbers** are often positioned differently, since they indicate the direction of elevation by always reading (pointing) uphill.

Some water feature symbols also reveal water flow direction (e.g. direction of flow arrow in rivers, falls symbols pointing downstream).

At a glance, you can easily identify wooded areas (green) and clearings (white).

Aerial photographs can enhance the use of your topographic map by providing an aerial view of the ground features shown on the map sheet. They are available for all NTS map sheets and may be obtained from the National Air Photo Library.

Maps 101 - Topographic Maps, The Basics

Topographic Map Symbols

In cartography, **symbols are everything**. The very nature of a map as an abstracted representation of the Earth requires symbols to perform the abstraction. To not have symbols is to not have maps.

When we first think of symbols, we tend to think of graphics representing elements that appear at **points**, like bridges and houses. Symbols can also be **linear**, representing such features as roads, railways and rivers. However, we also need to include representations of **area**, in the case of

forested land or cleared land; this is done through the use of color.

The set of symbols and their appropriate use on National Topographic System (NTS) maps is described by a specific set of rules: **Standards and Specifications for Polychrome Maps**. This guide ensures uniform depiction of land features on both 1/50 000 and 1/250 000 maps. However, like other forms of information, maps invariably undergo change. As an example, the fourth edition of a textbook will not have the same cover design or table of contents as the first edition. The information will be as reliable, but will have been reworked in certain places to reflect new findings or deliver the material in a more accessible fashion. In a similar way, changes are made to the symbols shown on NTS maps. **Newer editions of our 1/50 000 and 1/250 000 maps use symbols which look different from our older maps.** These changes reflect our goal to keep improving the communication qualities of our symbol library. The similarities between symbols used in an early edition and symbols in a more recent edition will likely be apparent to you. However, please keep in mind that the best way to use our maps is to refer to the symbols printed on the back of each sheet.

Because there are only a handful of colors to use and a lot of ground features to be shown on our topographic maps, the design of every symbol needs to be very carefully thought through. The list of symbols used on NTS maps is very long.

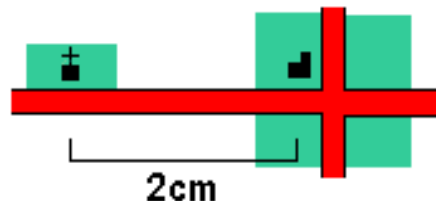
Some categories of symbols on our maps include many different features. To let map users learn more about features in those categories, **labels** are used. A good example of how labels are helpful is with large buildings: a label will indicate which building is a hospital and which is a skating rink.

Maps 101 - Topographic Maps, The Basics

Map Scale

What is SCALE?

Maps are made to **scale**. In each case, the scale represents the ratio of a distance on the map to the actual distance on the ground. For example, if 2 cm on a map ...



represents 1 km on the ground ...

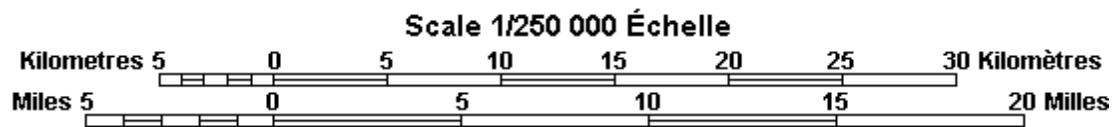


the scale would be **2 cm = 1 km**, or...

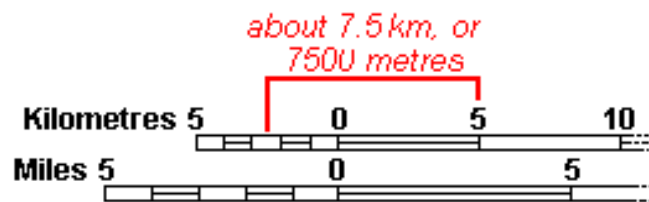
$$\begin{aligned} \frac{\text{Distance on the Map}}{\text{Distance on the Ground}} &= \frac{2 \text{ cm}}{1 \text{ km}} = \frac{2 \text{ cm}}{100\,000 \text{ cm}} \\ &= \frac{1}{50\,000} \\ &= \mathbf{1/50\,000 \text{ Scale}} \end{aligned}$$

Reading Distances on a Map

Use the **Scale Bar** found at the bottom of every NRCan topographic map to determine distances between points or along lines on the map sheet. (*Note, the example below is not to scale.*)



Use the secondary division on the left of the Scale Bar for measuring fractions of a kilometer. The measurement indicated is about 7.5 kilometers or 7 500 meters.



Map Using Do's and Don'ts:



Map Do's:

1. Store it properly.
2. Fold it properly.
3. Dry it flat if it gets wet.
4. Cover it with plastic.
5. If you must write on it, use a pencil!

405.01 Silver Star



Map Don'ts:

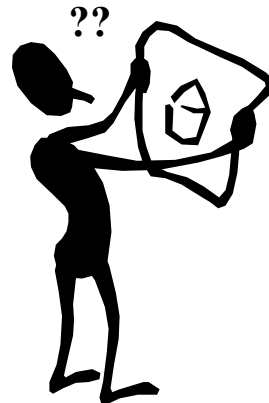
1. Never open it fully in the wind.
2. Never mark on it in pen - it's permanent!
3. Avoid dirt and water they will weaken the paper.

OHP-4

MARGINAL INFORMATION

In order to use a map properly, you must understand the information found on it.

1. Name of the Map Sheet
2. Number of the Map Sheet
3. Date of the Map Data
4. Magnetic Declination
5. Explanation of a Grid Reference
6. Reference Plate of Conventional Signs
7. Index to Adjacent Map Sheets
8. Map Scale
9. Scale Bars



405.02 Silver Star



OHP-1


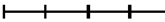
ACTIVITY A



Conventional Signs



You are tasked with taking your Platoon on a route march. You don't have a map. The only information you have about the terrain you will travel over is provided with the following conventional signs. You must brief your group from this information. Translate the signs into their meaning.


START AT :



(1)  _____ (heading of 3200 mils) go past the (2)  _____ and over the


(3)  _____ follow the (4)  for one kilometer _____ turn west



at the (5)  _____. When you reach the (6)  _____ follow it in the direction of


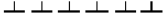
flow until you reach the (7)  _____ turn to 4000 mils and walk until you reach the (8) 



_____ go north through the (9)  _____ until you reach


the (10)  _____ follow in the direction of flow until you reach the (11)  _____ go across and

walk towards the (12)  _____. Climb along the

(13)  _____ past the (14)  _____ through the (15)

 _____. Follow the (16)  _____ to the

(17)  _____ and go into the (18)  _____. Find the

(19)  _____ and enjoy your lunch.

20. There are at least nine different types of maps – name five.

1. _____

2. _____

3. _____

4. _____

5. _____

21. What type of map, most commonly used in army cadets, can be identified by contour lines and elevations?

22. What is the scale of map at Annex A?

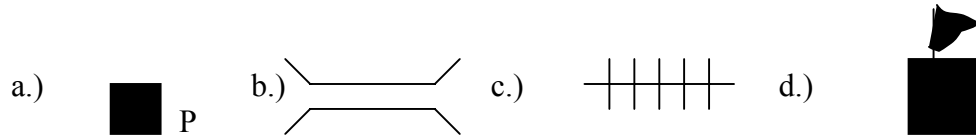
23. The contour lines on this map are what color?

24. What is the contour interval of this map?

(include a measurement – feet/inches/meters)

UNIT 5 ASSIGNMENT

1. Which of the conventional signs below represents a bridge?



2. Which of the conventional signs above represents a school?

3. What are conventional signs?

- a. Symbols used to illustrate on a map various objects or features on the ground.
- b. Actual objects and features on the ground.
- c. Photographs of various ground features.
- d. None of the above.

Place the following terms with the appropriate definitions below that would best describe it. Write the name of the feature beside the definition.

4. Crest

5. Plateau

6. Escarpment

- a.) A steep hillside formatted by a sudden drop in the general ground level, usually from a plateau. _____
- b.) Is an elevated region usually quite long and level. _____
- c.) The highest part of a hill or mountain. _____

7. Conventional signs are coloured according to the category. What colour is used for unpaved roads? _____

8. Contour Intervals are indicated by which of the following colors?

- a.) red b.) black c.) brown d.) none of the above

9. How many meters are in a kilometer?

- a.) 1700 b.) 1000 c.) 1760 d.) 5280

UNIT 6
Map & Compass
Parts of a Compass and Points on a Compass

1. This unit should take you three hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80% you should complete all the reading, activities, and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 5-30 to 5-37
- b. Additional Reading (included): Government of Canada Website: Maps 101
 Topographic Maps, The Basics.
<http://maps.nrcan.gc.ca/maps101/>
 - i) Compass Bearings
 - ii) Magnetic Declination
 - iii) The Magnetic Compass
 - iv) Area's of Compass Un-Reliability

3. Activities and Exercise:

- a. Complete Unit 6 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer for additional help.
- a. Complete Unit 6 – Quiz 2, then check your answers.

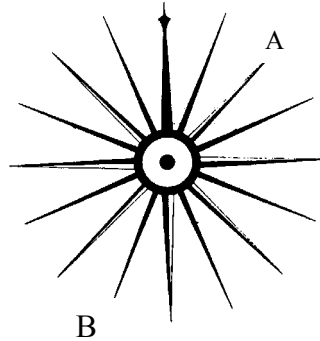
4. Unit 6 Assignment: This unit's assignment is a 20-question quiz. The questions are very similar to the type you will find on the Map & Compass Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 16 Map and Compass questions on the written exam.

Quiz 1

Use the following diagram to answer questions 1-2.



1. What is direction "A"?
 - a) North North East
 - b) North East
 - c) South East
 - d) South South East

2. What is direction "B"?
 - a) South South West
 - b) South East
 - c) North East
 - d) South East East

3. How many mils are there is a full circle?
 - a) 3600
 - b) 6400
 - c) 360
 - d) 640

4. How many degrees are in a full circle?
 - a) 3600
 - b) 6400
 - c) 360
 - d) 640

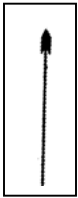
5. How many degrees are in one mil?
a) 1
b) 0.056
c) 18
d) 56
6. How many mils are in one degree?
a) 0.18
b) 10
c) 17.7
d) 177
7. How many mils are in 265° ?
a) 4691
b) 469
c) 14.7
d) 147
8. How many degrees are in 1550 mils?
a) 80
b) 86.8
c) 279
d) 2790
9. How many mils is East?
_____.
10. How many mils is South West?
_____.
11. How many mils is North East?
_____.
12. How many mils is North North East?
_____.

13. What is this symbol?



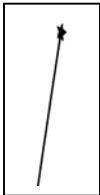
- a) Declination
- b) Magnetic North
- c) True North
- d) Grid North

14. What is this symbol?



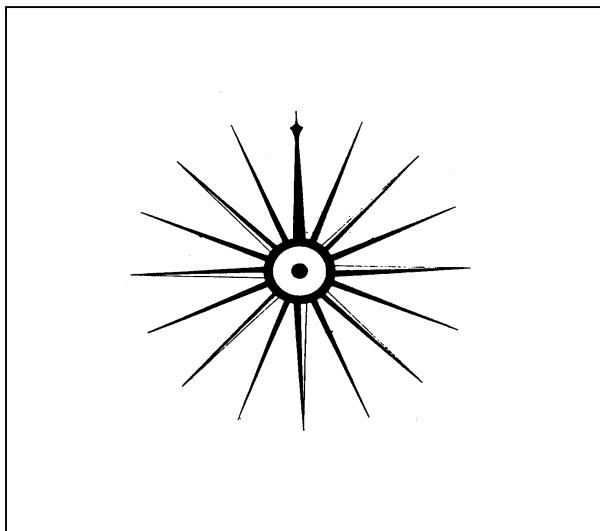
- a) Declination
- b) Magnetic North
- c) True North
- d) Grid North

15. What is this symbol?



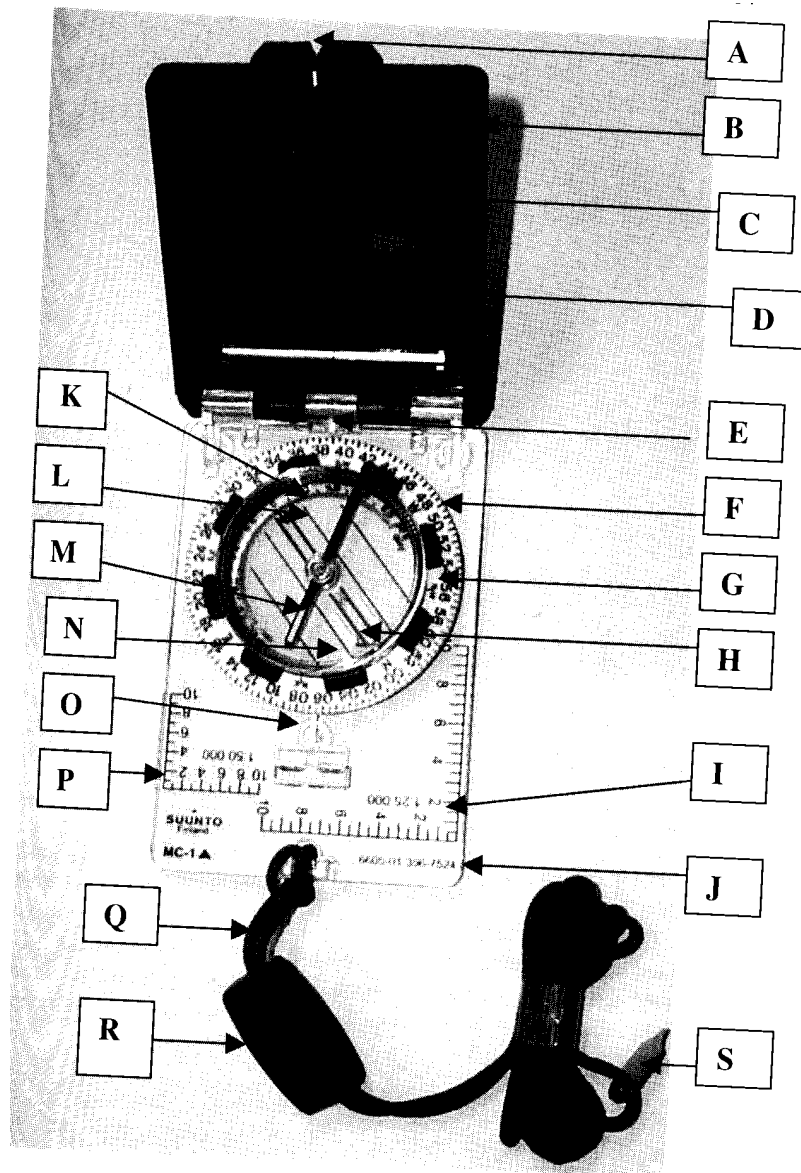
- a) Declination
- b) Magnetic North
- c) True North
- d) Grid North

16. Label the following points on to the diagram.



- a) North
- b) North East
- c) East
- d) South East
- e) South
- f) South West
- g) West
- h) North West

17. Label the all parts of the compass on to the diagram provided.



Summary of Important Points from the Reference Book Parts of a Compass and Points on a Compass

History of the Compass and How it Works

- the Chinese discovered the orientating effect of magnetite and developed the first compass
- the earth's magnetic field exerts a force on the compass needle, causing it to rotate and stop in the same direction as the magnetic field
- the horizontal force of the magnetic field decreases in strength as one approaches the North Pole

Parts of the Compass

- sighting line, used to align the compass dial in the sighting mirror
- dial graduations, in mils along the outside of the compass dial
- magnetic needle, the red needle that swings freely and points to magnetic north
- safety cord or lanyard, used to secure the compass

Cardinal Points

- there are four main cardinal points (N, S, E, W)
- the four main points are subdivided into a further twelve points
- there are measurements of both degrees and mils which correspond to every one of the cardinal points

The Three North's

- true north
- grid north
- magnetic north

Mils and Degrees

- there are three hundred sixty degrees in a circle (360°), sixty minutes in a degree ($60'$) and sixty seconds in a minute ($60''$)
- there are 6400 mils in a circle
- there are 18 mils in 1 degree

ADDITIONAL READING
MAPS 101 TOPOGRAPHICAL MAPS, THE BASICS

<http://maps.nrcan.gc.ca/maps101/>

Compass Bearings

A compass points to **magnetic north**; but this may not be the same as **grid north**, which depends on your locality. If you live close to the imaginary line that runs from Thunder Bay through Savant Lake, in northern Ontario, northwest through Churchill, Manitoba, you are in luck. Here your compass north is approximately the same as grid north. But if you live east of this line, your compass points off to the west, while west of that line it points off to the east. The reason is that the North Magnetic Pole, which attracts the compass needle, is situated at 78.3° N, 104.0° W, on Noice Peninsula, southwest Ellef Ringnes Island in the Northwest Territories. (Visit the Geological Survey of Canada's [Canadian National Geomagnetism Program Web Site](#) for more information about the North Magnetic Pole.)

Compasses are available in many forms. The simplest is the common needle compass, which consists of a magnetic needle held free to rotate over a compass card. Remember, when the needle comes to rest, it is pointing at magnetic north. Turn the compass gently under the needle until north on the card lies under the north end of the needle. Magnetic directions are then indicated by the card. (More expensive compasses, such as prismatic and orienteering compasses, have additional features that make it easier to read directions. Instruction booklets for these compasses should be obtained from the dealer.)

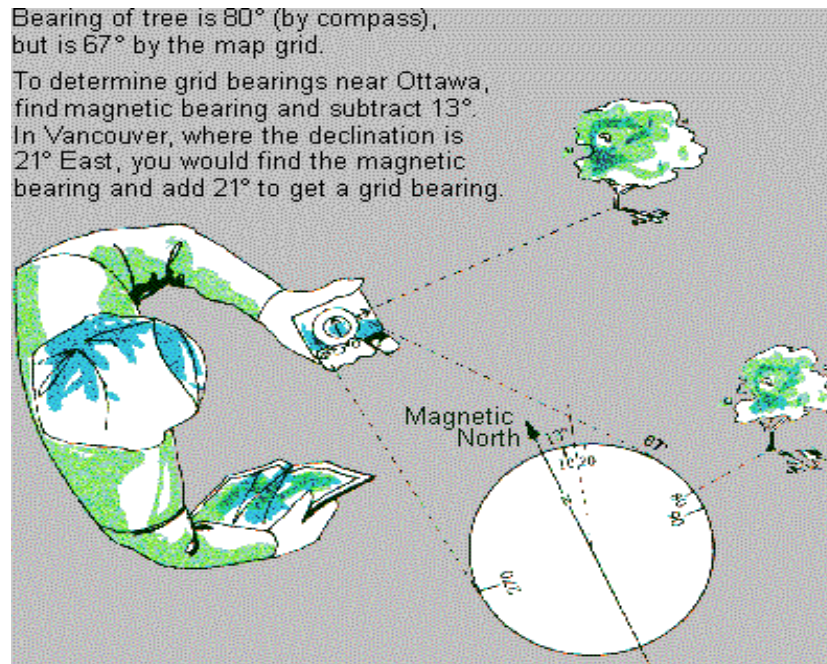
Finding compass bearings and grid bearings

To find grid bearings you must know how far off grid north the compass points in your locality. Look in the margin of your NTS topographic map for the compass **declination**. The rhyme to use is:

Declination East - Magnetic least (i.e. magnetic less than grid)

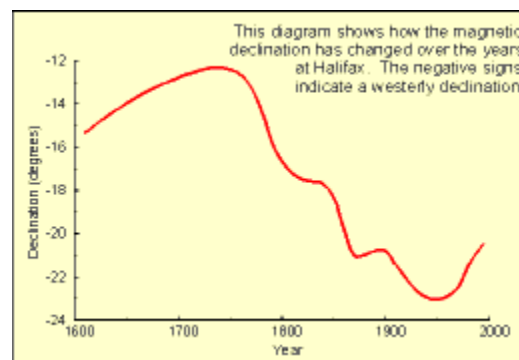
Declination West - Magnetic best

As an example, in Ottawa the compass points off to the west (declination west) about 13°. So according to the rhyme, a magnetic bearing is greater than a grid bearing.



Following a compass bearing

With your compass oriented (i.e. with North on the card under the north end of the needle), look along the compass bearing you want to follow. Pick a landmark in this direction, such as a large tree or building. Walk toward this landmark, then sight with the compass to the next landmark along the route. Continue to your destination.



Magnetic Declination

(What do you mean "North isn't North")

Many people are surprised to learn that a [magnetic compass](#) does not normally point to true north. In fact, over most of the Earth it points at some angle east or west of true (geographic) north. The direction in which the compass needle points is referred to as magnetic north, and the angle between magnetic north and the true north direction is called **magnetic declination**. You will often hear the terms "variation", "magnetic variation", or "compass variation" used in place of magnetic declination, especially by mariners.

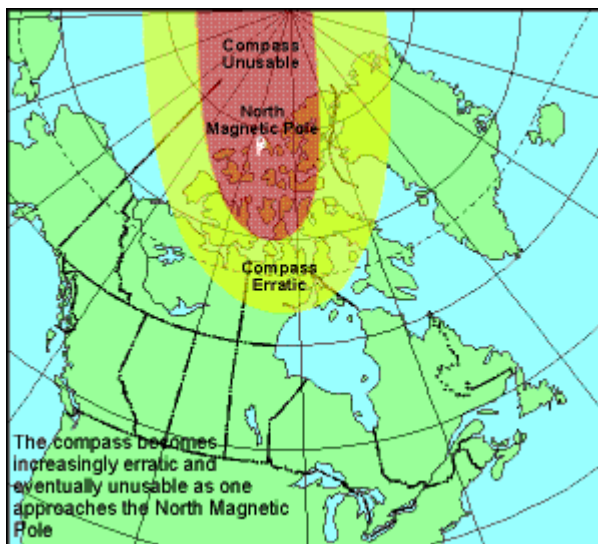
The magnetic declination does not remain constant in time. Complex fluid motion in the outer core of the Earth (the molten metallic region that lies from 2800 to 5000 km below the Earth's surface) causes the magnetic field to change slowly with time. This change is known to as **secular variation**. As an example, the accompanying diagram shows how the magnetic declination has changed with time at Halifax. Because of secular variation, declination values shown on old topographic, marine and aeronautical charts need to be updated if they are to be used without large errors. Unfortunately, the annual change corrections given on most of these maps cannot be applied reliably if the maps are more than a few years old since the secular variation also changes with time in an unpredictable manner. If accurate declination values are needed, and if recent editions of the charts are not available, up-to-date values for Canada may be obtained from the most recent [geomagnetic reference field](#) models produced by the Geological Survey of Canada.

The Magnetic Compass

The **magnetic compass** has been used for navigation for hundreds of years. At one time, it was the only reliable means of direction-finding on days when the sun and stars were not visible. Nowadays, sophisticated equipment is available that enables users to determine their bearing accurately and to pinpoint locations to within a few metres. However, such equipment has not made the compass obsolete. It is still a very practical tool for navigation for many small craft and for people on foot. Even airplanes and ships equipped with more sophisticated equipment often carry compasses as backups.

Compasses come in a variety of shapes and sizes depending on their intended use. The type of compass used on a ship or aircraft is a complex device capable of compensating for both the motion of the craft and its metallic structure. At the other extreme are small pocket compasses of low precision intended for casual use.

Regardless of their intended purpose or the complexity of their construction, most compasses operate on the same basic principle. A small, elongated, permanently magnetized needle is placed on a pivot so that it may rotate freely in the horizontal plane. The Earth's **magnetic field** which is shaped approximately like the field around a simple bar magnet exerts forces on the compass needle, causing it to rotate until it comes to rest in the same horizontal direction as the magnetic field. Over much of the Earth, this direction is roughly true north, which accounts for the compass's importance for navigation.



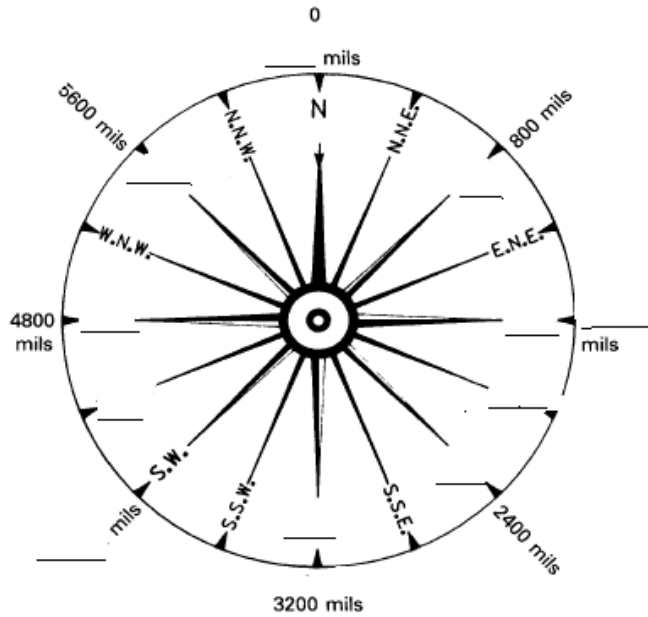
Area of Compass Unreliability

The horizontal force of the magnetic field, responsible for the direction in which a compass needle is oriented, decreases in strength as one approaches the [North Magnetic Pole](#), where it is zero. Close to the pole, an area is reached where the frictional forces in the pivot are comparable to the horizontal forces of the magnetic field. The compass starts to behave erratically, and eventually, as the horizontal force decreases even more, the compass becomes unusable

QUIZ 2

POINTS ON THE COMPASS

Fill in the missing information in the blanks provided.



1. Write a paragraph defining, and describing the differences between true, grid and magnetic north.

Unit 6 – Assignment

1. Where is North North West found on a compass?
 - a) 2800 mils
 - b) 6000 mils
 - c) 0400 mils
 - d) 5600 mils

2. Magnetic North is?
 - a) The axis which passes through the North and South pole.
 - b) Indicated by grid lines on a topographical map
 - c) Near Thunder Bay, ON.
 - d) Where a magnetic compass needle points.

3. What is the proper name for the part of the compass that is the red needle pointing to north?
 - a) Compass Meridian Needle
 - b) Magnetic Needle
 - c) Needle Sight
 - d) Magnetic Sight

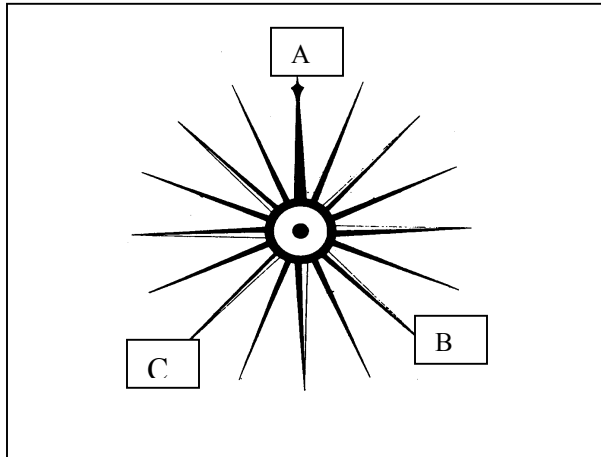
4. Where is a back bearing read from?
 - a) 1:50 000 romer
 - b) Luminous Orienteering Point
 - c) Luminous Index Point
 - d) Luminous Orienteering Arrow

5. What is the function of the Magnetic Needle?
 - a) To magnetize the sight
 - b) To secure the compass
 - c) Points to magnetic north
 - d) Points to magnetic south

6. What is the function of the romer?
 - a) Used to measure bearings
 - b) Used to align the dial with the map
 - c) Roam around looking for North
 - d) Used to measure exact points on the map

7. Which North is located at the top of the earth where the lines of longitude converge?
- a) Quantum
 - b) True
 - c) Grid
 - d) Magnetic
8. Where is Grid North located?
- a) Where the magnetic needle points
 - b) Where the lines of longitude converge
 - c) Where the North pole is
 - d) Where the lines of a topographical map indicate

This diagram will be used for questions 9-11.



9. What is point "A"?
- a) North
 - b) South East
 - c) South West
 - d) South
10. What is point "B"?
- a) North
 - b) South East
 - c) South West
 - d) South

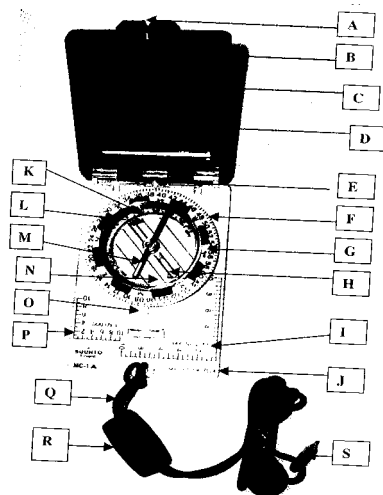
11. What is point "C"?
 - a) North
 - b) South East
 - c) South West
 - d) South

12. How many degrees are in 30 mils?
 - a) 28°
 - b) 2.8°
 - c) 50°
 - d) 150°

13. How many mils are in 50 degrees?
 - a) 800 mils
 - b) 885 mils
 - c) 985 mils
 - d) 3 mils

14. At what measurement of mils is South South West?
 - a) 0400
 - b) 0800
 - c) 360
 - d) 3600

The following diagram will be used for questions 15 – 20.



15. What part of the compass is “S”?
- a) Declination Adjusting Screw
 - b) Declination Adjusting Screwdriver
 - c) Declination Adjustment
 - d) Declination Orienteering Romer
16. What part of the compass is “I”?
- a) Romer Index Point
 - b) 1:50 000 romer
 - c) 1:250 000 romer
 - d) 1:25000 romer
17. What part of the compass is “H”?
- a) Dial Graduation
 - b) Orienteering Arrow
 - c) Luminous Orienteering Points
 - d) Compass Base Plate
18. What part of the compass is “A”?
- a) Sight
 - b) Sighting Line
 - c) Declination Line
 - d) Targeting System
19. What part of the compass is “E”?
- a) Luminous Orienteering Point
 - b) Luminous 1:50 000 romer
 - c) Magnetic Needle
 - d) Luminous Index Point
20. What part of the compass is “J”?
- a) Compass Base Plate
 - b) Compass Cover
 - c) Declination Line
 - d) Orienteering Arrow

UNIT 7
Map & Compass
Conversion of Bearings, Plan and Lead a Nav Ex, and the GPS

1. This unit should take you 3 hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 80-90%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 80% you should complete all the reading, activities, and exercises in this unit.
2. Reading:
 - a. Army Cadet Reference Book, Pages 5-53 to 5-66
3. Activities and Exercise:
 - a. Complete Unit7 – Quiz 1, then check your answers. If you get 80-90% on this quiz, move on and complete the Unit 7 Assignment. If you do not get at least 80%, review the areas where you have had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer for additional help.
 - a. Complete Unit 7– Quiz 2, then check your answers.
4. Unit 7 Assignment: This unit's assignment is a 20-question quiz. The questions are very similar to the type you will find on the Map & Compass Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You can expect to find 16 Map and Compass questions on the written exam.

QUIZ 1

1. Convert a grid bearing of 3000 mils to a magnetic bearing, given that the declination is West 180 mils.

2. Convert a magnetic bearing of 4400 mils to a grid bearing, given that the declination is West 270 mils.

3. Convert a magnetic bearing of 1800 mils to a grid bearing, given that the declination is East 165 mils.

4. Convert a grid bearing of 6200 mils to a magnetic bearing, given that the declination is East 280 mils.

5. For conversion purposes, there are _____ mils in one degree.

6. When planning a navigational exercise, list three considerations to include:

7. Another word for re-section is “triangulation”.

True

False

8. Radio waves speed up as they pass through the clouds of electrons in the ionosphere.

True

False

9. The global positioning system was developed as a navigation aid for:

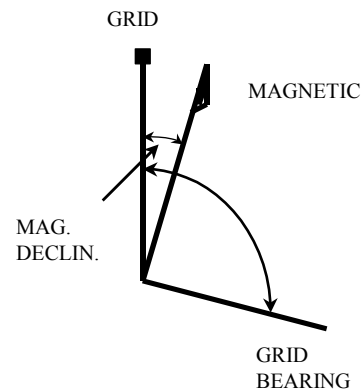
- a. international commercial aircraft
- b. military jets conducting training
- c. submarines
- d. intercontinental ballistic missiles (ICBM)

10. Identify the three components of the Global Positioning System (GPS).

ADDITIONAL READING**CONVERTING BEARINGS**

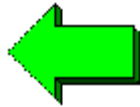
Before converting a grid bearing to a magnetic bearing and vice versa, there are two things you must do:

- 1. Update the magnetic declination on your map.**
- 2. Draw a sketch of the norths and the bearing you are working with.**
 - a. Draw a zero line for **Grid North**.
 - b. Plot the **Magnetic North** zero line east or west of Grid North depending on the declination.
 - c. Plot a line clockwise from the appropriate North to represent the **bearing**.



CONVERTING FROM A GRID TO A MAGNETIC BEARING

When converting to a magnetic bearing, you either add or subtract the magnetic declination, which is also called the **grid magnetic angle (GMA)**.



WEST IS BEST: When the GMA is **west** of Grid North, **add** it to the grid bearing.



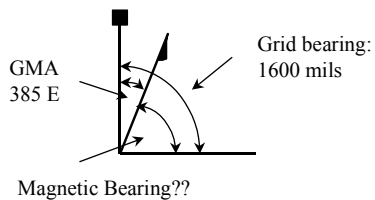
EAST IS LEAST: When the GMA is **east** of Grid North, **subtract** it from the grid bearing.

405.02 Gold Star

OHP-2

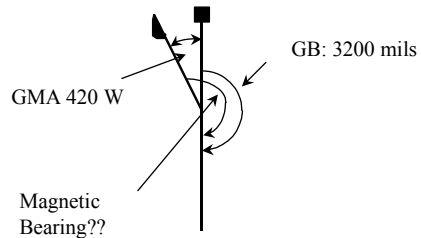
CONVERTING FROM GRID TO MAGNETIC

Easterly declination:



Mag. Bearing = Grid Bearing - GMA
 MB = 1600 mils - 385 mils (East is Least)
 MB = **1215 mils**

Westerly declination:



MB = GB + GMA (West is Best)
 MB = 3200 mils + 420 mils
 MB = **3620 mils**

405.02 Gold Star

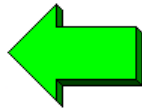
OHP-3

CONVERTING FROM A MAGNETIC TO A GRID BEARING

Converting from a magnetic to a grid bearing is done in the same manner, but with a few important differences.



WEST IS LEAST: When the GMA is **west** of Grid North, **subtract** it from the magnetic bearing.



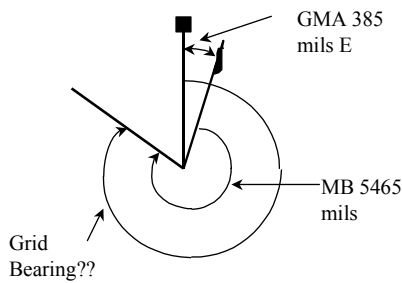
EAST IS BEST: When the GMA is **east** of Grid North, **add** it to the magnetic bearing.

405.02 Gold Star

OHP-4

CONVERTING FROM MAGNETIC TO GRID

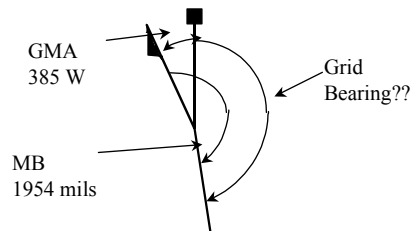
Easterly declination:



$$\begin{aligned} \text{GB} &= \text{MB} + \text{GMA (East is Best)} \\ \text{GB} &= 5465 \text{ mils} + 385 \text{ mils} \\ \text{GB} &= \mathbf{5850 \text{ mils}} \end{aligned}$$

405.02 Gold Star

Westerly declination:



$$\begin{aligned} \text{GB} &= \text{MB} - \text{GMA (West is Least)} \\ \text{GB} &= 1954 \text{ mils} - 385 \text{ mils} \\ \text{GB} &= \mathbf{1569 \text{ mils}} \end{aligned}$$

OHP-5

QUIZ 2

1. Convert a grid bearing of 5900 mils to a magnetic bearing, given that the declination is West 12° .

2. Convert a magnetic bearing of 0500 mils to a grid bearing, given that the declination is West 375 mils.

3. Convert a magnetic bearing of 1645 mils to a grid bearing, given that the declination is East 175 mils.

4. Convert a grid bearing of 2800 mils to a magnetic bearing, given that the declination is East 200 mils.

5. To do a re-section, you require at least _____ and preferably _____ features on the ground.

a. 3, 4

b. 1, 2

c. 2, 3

d. 4, 5

6. List three factors that limit a global positioning system receiver.

7. List three common uses/advantages of a handheld global positioning system.

Unit 7 - Assignment

1. Convert a magnetic bearing of 3400 mils to a grid bearing, given that the declination is West 170 mils.
2. Convert a magnetic bearing of 1800 mils to a grid bearing, given that the declination is East 215 mils.
3. Convert a grid bearing of 1600 mils to a magnetic bearing, given that the declination is East 275 mils.
4. Convert a grid bearing of 6300 mils to a magnetic bearing, given that the declination is West 125 mils.

5. When comparing global positioning systems, the civilian receiver is more accurate than a military receiver.

True

False

6. The global positioning system was declared fully operation in the year:

a. 1962

b. 1995

c. 1974

d. 2000

7. A typical receiver on a global positioning system needs to receive broadcasts from _____ satellites in order to process an accurate position.

a. 3

b. 4

c. 5

d. 6

SECTION C
NSCE PART TWO

Unit 8

Map and Compass

Four/Six Figure Grid References, Measuring Distance, Contour Lines

1. This unit should take you two hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 100%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 100%, you should complete all the reading, activities and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 5-14 to 5-19
- b. Army Cadet Reference Book 5-24 to 5-29
- c. Additional Readings (included): Government of Canada Website: Maps 101 Topographic Maps, The Basics.
<http://maps.nrcan.gc.ca/maps101/>
 - i. Map Projections
 - ii. The UTM Projection
 - iii. Rectangular Grid References
 - iv. Rectangular Grid References, Civil & Mil

3. Activities and Exercise:

- b. Complete Unit 8 – Quiz 1, then check your answers. If you get 100% on this quiz, move on and complete the Unit 8 Assignment. If you do not get at least 100%, review the areas where you have had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer for additional help.
 - a. Complete Unit 8 – Quiz 2, then check your answers.
4. Unit 8 Assignment: This unit's assignment is a 10 question multiple-choice quiz. The questions are very similar to the type you may find on the Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn the assignment into your Training Officer. They will mark the assignment and return it to you.



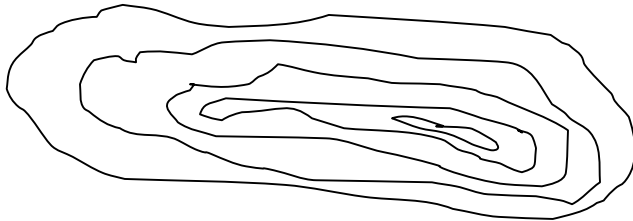
There are some theoretical questions from this section on the written exam; however, the critical component of this unit is your ability to accurately plot a six-figured grid reference, measure a distance and read an elevation.

QUIZ 1

(Use map at Annex A to answer the following questions)

1. Circle the letter(s) of the correct statement(s) below.
 - a. on 1 over 25,000 maps contours far apart mean gentle slopes.
 - b. on 1 over 25,000 maps contours close together mean steep slopes.
 - c. both 'a' and 'b' are correct.
 - d. neither 'a' and 'b' are correct.

2. The following diagram represents some contours on a map. Indicate (label) on the diagram a steep slope and a gentle slope.



3. At GR 431493, which side of the river has the steepest hill (left or right).

4. If you are located at GR 484509 where would you be?
 - a. in a valley
 - b. on flat ground
 - c. on the top of a hill

5. South of the contour line at GR 485485, the ground
 - a. Rises
 - b. Falls

6. Using the roamer that you constructed, and this map what are at the following grid references?

a. GR 493531 _____

b. GR 439521 _____

c. GR 445548 _____

d. GR 414468 _____

7. Following the nearest road, measure the distance between the following grid references.

a. 'T' junction at GR 548482 to school at GR 495463 (in meters)

b. Sawmill at GR 395469 to the junction at GR 414521 (in meters)

8. What is the distance (in a straight line) between the following grid references?

a. The motel at GR 493531 to city hall at GR 522484 in meters (+/- 50 meters)

b. The lumberyard at GR 416468 to the campground at GR 445546 (in meters).

9. Which scale bar measures meters on the map you are using?

a. the top bar

b. the bottom bar

10. Give six figure grid references for the following places.

a. Picnic site in grid square 4454

b. Bridge in grid square 5448

c. Hall in grid square 4345

d. Sawmill in grid square 3946

e. School in grid square 4345

11. a. Draw a line from the hall at GR 401508 to the sawmill at GR 395469. If you were walking along this line, describe in narrative form the ground that you would walk over. (i.e. up/down hills, swamps, road, trees, etc.)

b. What is the highest point of land you would cross? _____

12. There are buildings at GR509481 and GR 498470.

a. Which building is on high ground? _____

b. What is the difference in height? _____

Summary of Points from the Reference Book

Four/Six Figure Grid References, Measuring Distance, Contour Lines

Universal Transverse Mercator Grid (UTM)

- distortion occurs when a projection of the earth is placed on a flat surface, going from round to flat.
- map projection is used to reduce distortion (we use UTM)
- the right margin on a map gives you zone information

Grid Reference System

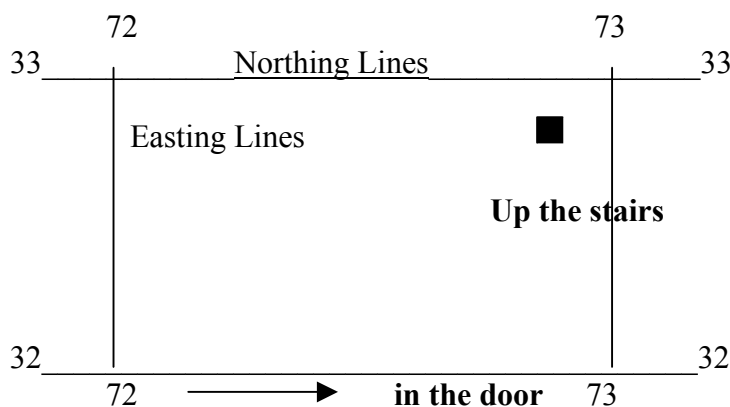
- grid lines are shown in blue
- eastings are the vertical lines which run west to east
- northings are the horizontal lines which run from the equator north

Military Grid Reference System

- two digit numbers repeat over a large area; the military has established a letter code for each 100 km square. Military grid code is found in right margin underneath the UTM zone number

Four & Six figure grid reference:

- eastings are stated before northing, an easy way to remember is to remember the saying: “in the door up the stairs” (e.g. This would read 7232)

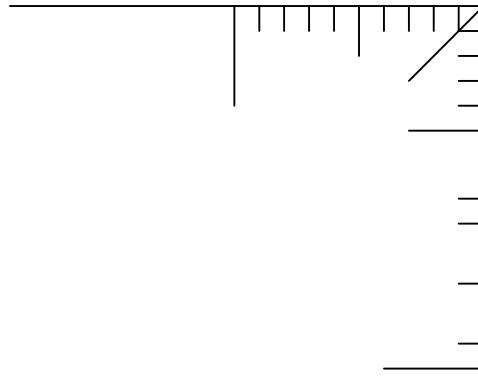


- four figure grid references will find an object within 1000 m square, and six figure will find an object within 100 m square using a six figure grid reference you can estimate a

grid figure (using the figure above for an estimate grid reading of the building would be 728328) or you can achieve a more accurate measurement using a tool called a romer

Construction and Use of a Romer

- at the bottom center of map are scale bars – one of them is scaled in meters. The left of the meter bar is divided into tenths. Take a blank card, place it along the left of the meter bar, and mark off the tenths in the upper right hand corner, as illustrated in diagram box. **MAKE SURE YOUR PENCIL IS SHARP.**
(Not drawn to scale)



- always round numbers down
- can be used to find an object on your map from your grid figure information (e.g. 764324 – This tells you to look for easting 764 and northing 324 and you would find the church)
- a romer for both 1/25,000 and 1/50,000 can be found on your rectangular protractor

** Using material supplied and your map, construct a romer. Once this is completed, have your Training Officer check it

Measuring Distance between two points on a Topographical Map

there are two ways to describe distance: Point to Point (straight line between two points) and along a route (can be along a road, path or your planned route). Use paper and pencil ticks to achieve your distance

use the scale bar if your need assistance in reading the distance from your paper strip

Contour lines

contour lines are light brown

contour interval information can be found in the bottom margin of the map

must be able to recognize type of slopes, spurs and re-entrants (refer to reference book and additional readings)

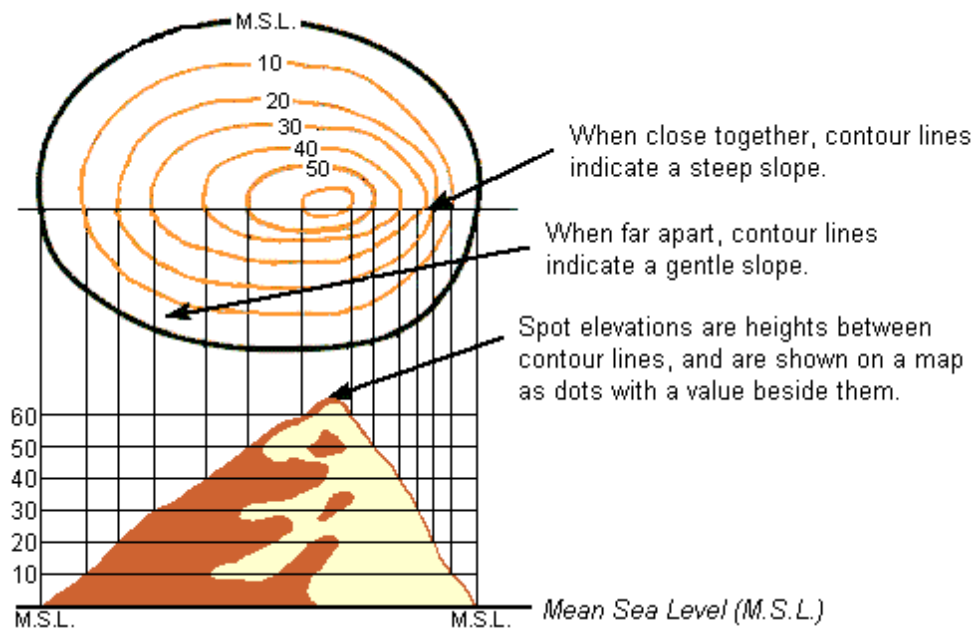
ADDITIONAL READING
MAPS 101 TOPOGRAPHICAL MAPS, THE BASICS

<http://maps.nrcan.gc.ca/maps101/>

Maps 101 - Topographic Maps, The Basics

What are Contours?

Contour lines connect a series of points of equal elevation and are used to illustrate topography, or relief, on a map. They show the height of ground above Mean Sea Level (M.S.L.) in either feet or meters and can be drawn at any desired interval. For example, numerous contour lines that are close together indicate hilly or mountainous terrain; when far apart, they represent a gentler slope.



The Universal Transverse Mercator Grid

Section 1 - Map Projections

Because the Earth is a sphere, any representation of its surface on a flat sheet of paper involves **distortion**. This distortion is relatively insignificant for maps showing small parts of the Earth, such as city maps, but quite considerable for maps of whole countries or continents.

The decision facing a map-maker, therefore, is not whether to have a distortion on a map, but what type of distortion. Over the centuries, various geometrical schemes have been worked out for representing the curved surface of the Earth on map sheets; these schemes are known as **map projections**. All projections have certain advantages and disadvantages, and the selection of one or the other depends chiefly on the needs of the user.

The size and shape of the country being mapped determines the most suitable projection for its system of topographic maps. Very large countries such as Canada must be divided into strips, usually called **zones**, which are projected onto a plane in orderly fashion. One such system of strip projection is the **Transverse Mercator**. It is called *transverse* because the strips run north south rather than east west along the equator, as in the standard Mercator projection. A special type of Transverse Mercator is the **Universal Transverse Mercator (UTM) Projection**. The Centre for Topographic Information uses the Universal Transverse Mercator Projection for its popular National Topographic System (NTS) series at 1/50 000 and 1/250 000 scales. Tied in with this projection is the rectangular grid, a special system for finding and identifying points on maps. All topographic maps also carry the familiar lines of longitude and latitude, but these are not well suited for quick and simple point location and identification.

Section 2 - The Universal Transverse Mercator Projection

To understand how the projection works, imagine the Earth as an orange, with all geographical features and the parallels and meridians already drawn in. Now imagine taking a knife and, after slicing off small circles at the poles, making a straight north-south cut in the peel of the orange and repeating this north-south cut, at equal intervals, until 60 strips or zones have been detached (see Figure 1, below).

Each of these zones will then form the basis of a separate map projection. The flattening may be envisioned by again considering the detached zone as a strip of orange peel placed on a level surface. By depressing its center, one could force the peel to flatten until all of it touches the smooth surface. This flattening action results in a slight distortion of the geographical features within the zone, but because the zone is relatively narrow, the distortion is small and may be ignored by most map-users.

Because the globe is 360° in circumference, a division into sixty vertical zones gives each zone the width of 6° of longitude. By international usage, these zones have been numbered 1 to 60. Sixteen of the zones, bearing numbers **7 to 22**, cover Canada, as shown in Figure 2, below.

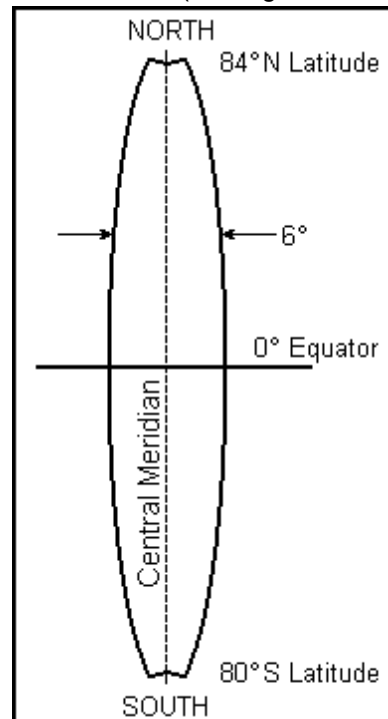


Figure 1 - Shape of a UTM Zone

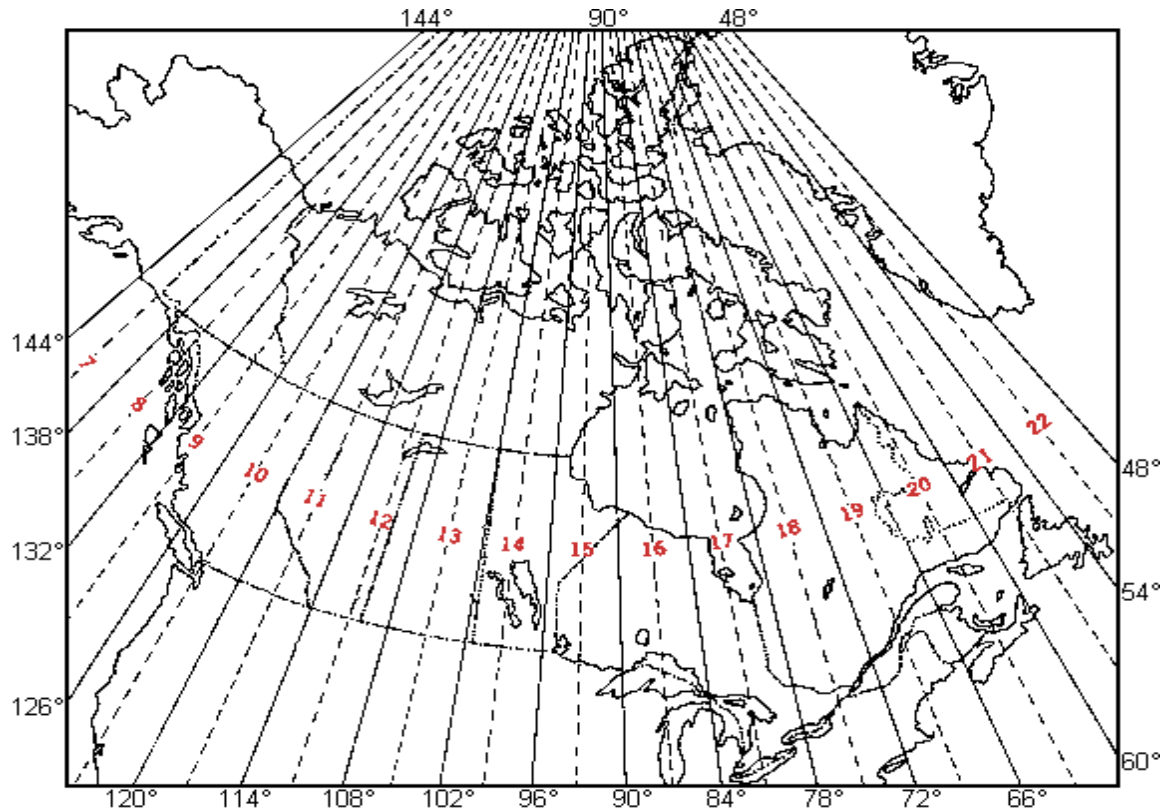


Figure 2 - UTM Zones and Central Meridians for Canada

Once the zone has been flattened onto a level surface it can be divided into a basic set of map sheets of a convenient size. These basic sheets are divided further into sections and each section is published as a map of a larger scale. In Canada this is done to produce the 1/250 000 and 1/50 000 scale maps, which are the two scales of the National Topographic System. By convention, the edges of most maps fall along parallels and meridians. In the far north, where zones are narrow, medium- and small-scale maps may show parts of more than one zone. The important feature of the Universal Transverse Mercator Projection is that the zones are standard and readily identifiable, so that an area may easily be designated as lying within a specific zone.

Section 3 - Rectangular Grid References

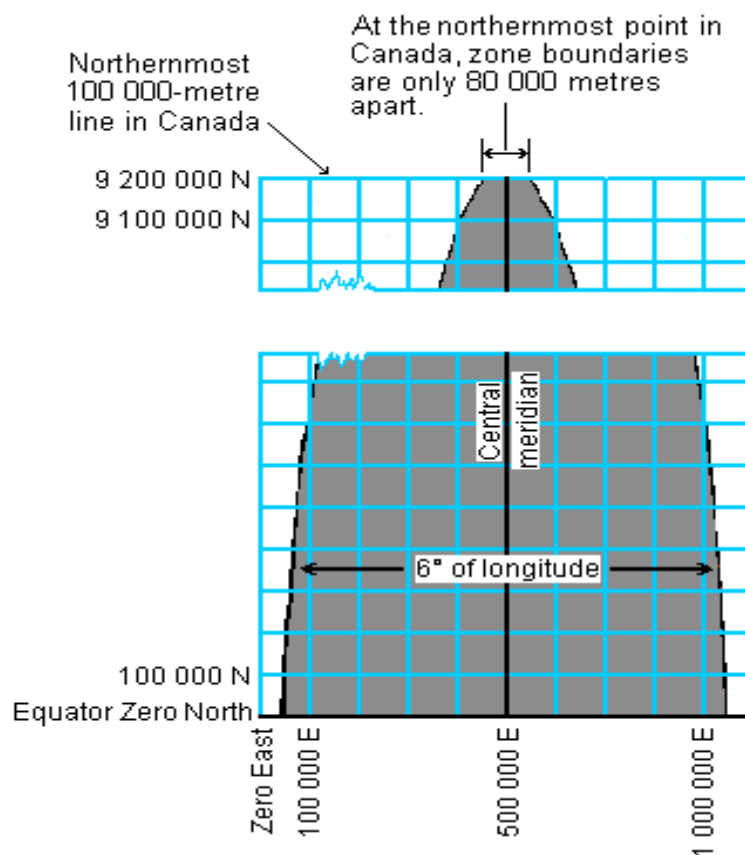
At one time or another, most of us have used a city map to find the location of a street. Such maps are usually divided by vertical and horizontal grid lines. The grid spaces formed by these lines are designated along one margin by letters and along the other by numbers. A combination of letters and numbers, such as "B-7", indicates the square formed by the intersection of column B and row 7; it is here that the desired street is to be found.

This system works fairly well for city and road maps, where the names of streets, cities, etc., are clearly printed. For most topographic maps, however, many of whose features bear no name, such a system would not be sufficiently precise. A petroleum engineer, for example, who wishes to describe the location of an oil well on a flat piece of prairie would hardly be satisfied with saying that it is located somewhere

within an area covering 25 square kilometers. Military tacticians also need a more exact system of pinpointing places on maps. It was requirements such as these which led to the development of the rectangular map grid.

This grid uses as its basic element of identification not squares, as the city map does, but lines. These lines are standard on all UTM maps. Because they are drawn on our "orange strips" after the strips have been flattened, the grid lines are perfectly straight and undistorted. The basic grid lines, both horizontal and vertical, are drawn 100 000 metres (100 km, or about 62 miles) apart.

All vertical lines run parallel to the central meridian of each zone, i.e., the meridian that runs down the centre of each zone exactly three degrees of longitude from either side. All horizontal lines run parallel to the equator (See Figure 3, below). It must be borne in mind here that the parallels of latitude shown on our UTM maps are not parallel to the equator, or to each other, because they are slightly distorted by the flattening. The equator itself is not distorted by the Transverse Mercator projection.



The squares formed by the intersection of the 100 000-metre lines are almost always further subdivided by 10 000-metre lines, 1 000-metre lines, and even 100-metre lines, depending on the scale and purpose of the map. Most maps show less than the width of a UTM zone, but information relating the map to the zone and defining the grid spacing, is always provided on the margin, for example:

ONE THOUSAND METER UNIVERSAL TRANSVERSE MERCATOR, GRID ZONE 17

The beauty of the UTM rectangular grid is that by using a brief code consisting of zone and grid-line numbers it is possible to identify any point in Canada, even if that point is not otherwise marked or identified on any map. Two systems are marked on NTS maps for identifying points with reference to the rectangular grid.

Section 4 - Rectangular Grid References

Two systems are marked on NTS maps for identifying points with reference to the rectangular grid.

- Civilian UTM Grid Reference System, below, and
- [Military Grid Reference System](#)

Civilian UTM Grid Reference System

Horizontal lines are designated by their distance from the equator in metres. Because Canada's southernmost point is about 4 620 000 metres from the equator, all horizontal lines in Canada have a "northing" value above that figure. Vertical lines are measured from a separate point for each zone, namely, an imaginary line lying 500 000 metres west of the zone's central meridian. Actually, zones never attain the full width of 1 000 000 metres which such a measurement suggests; in fact, in northern Canada, zone widths shrink to as little as 80 000 metres (40 000 metres on either side of the central meridian). In practice, this means that vertical lines are counted from the central meridian or 500 000 meter line, those to the left of it having an "easting" value of less than 500 000 metres, and those on the right having a value above that (see Figure 3, above).

The number of metres north of the equator represented by the bottom horizontal grid line on a map is always shown in the lower left-hand corner of the map. Similarly, the number of metres east of the zero vertical line represented by the left vertical grid line is also shown in the lower left-hand corner.

If a given point on a map is positioned exactly at the intersection of a vertical and horizontal line, its location may be read off simply from the map margins. Its full designation or its "coordinates" would include the zone number, followed by the easting and northing values. On a 1 000-metre grid, these coordinates might read: **Zone 14, 357 000, 5 476 000**. The values of the first vertical and horizontal lines appearing in the southwest corner of the map are given in full. The other grid lines are numbered in an abbreviated fashion.

Few points, however, are conveniently located at grid intersections. Usually the point to be described (such as the church in Figure 4, right) is somewhere between lines.

In this case, it is necessary to measure or estimate the distance to the nearest vertical line to the west and to the nearest horizontal line to the south and to add these metric values to the grid values given at the margin.

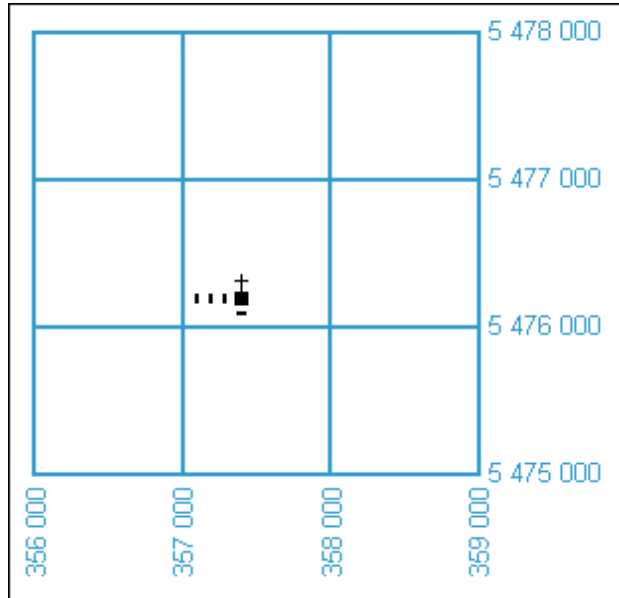


Figure 4

As in the above example, if a point is located 400 metres east of the vertical line of 357 000, and 200 metres north of the horizontal line of 5 476 000, its coordinates would be: **Zone 14, 357 400, 5 476 200**. With these three numbers, any point on the northern hemisphere can be unmistakably identified. There is a similar reference in the southern hemisphere, but confusion never results from this.

The civilian system of designating UTM Grid coordinates is straightforward and, since it uses only numbers, it can be handled by digital mapping software and Geographic Information Systems (GIS), an important consideration with any kind of technical data. It does, however, require the use of large and somewhat cumbersome figures. To get around this, military map-makers have developed a somewhat different system consisting of a combination of letter and numbers, the [Military Grid Reference System](#).

Section 5 - Rectangular Grid References

The Military Grid Reference System

To begin with, if there is no possible confusion about the map sheet on which the reference falls, the Military Grid Reference System provides a very quick and easy method of referencing. As previously mentioned, topographic maps carry a rectangular grid with numbers in the margin identifying the horizontal and vertical lines. On large-scale maps (1/50 000 and larger) each number consists of two digits as shown below:

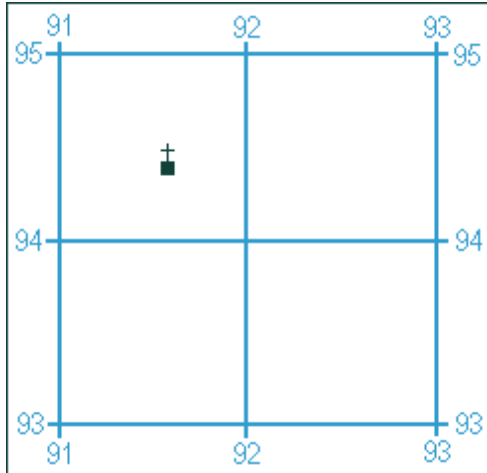


Figure 5 - The UTM grid

To arrive at a map reference for the church shown in Figure 5, we would first note the numbering of the lines that form the west and south of the square. For centuries, mathematicians have given the **X** coordinate before the **Y** coordinate; map users follow suit by quoting eastings before northings. Therefore the designation of the square containing the church would be **9194**.

To give a reference for the church itself, we must imagine the square divided into 100 smaller squares (ten by ten). Then we estimate by eye that the church is six tenths of the way between lines 91 and 92, and four tenths of the way between lines 94 and 95. Using these figures, we can quote the easting as being **916** and the northing as **944**. By convention these are combined into a reference of **916944**.

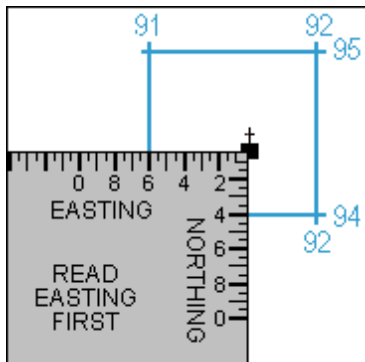


Figure 6 - Using a roamer on a UTM grid

Even more precision can be obtained by using a **roamer** (a small transparent card graduated with units of the proper scale) as shown in Figure 6. With the roamer, the reference can now be given as **91559435**. Note that the reference always has an even number of digits, the first half representing the easting, the second half the northing.

The Military Grid Reference System is convenient, but unfortunately reference numbers repeat themselves every 100 000 metres (100 km or about 62 miles). Therefore a method has been devised to identify the 100 000-metre squares by letters, which are printed in blue on the face of all NTS maps. This is particularly important in the case of medium- and small-scale maps (1/250 000 and smaller), as unlettered references are ambiguous on a single map. The identifying letters (two of them) are always given before the numbers. Figure 7, below, shows a reference on a 1/250 000 map (where grid lines are usually identified by a single number).

Here the church would be in square **NT99** and more precisely at point **NT9293**. This reference is still not unique, but the same reference does not occur again for about 2 900 km (1 800 miles). For most purposes this is sufficiently unambiguous.

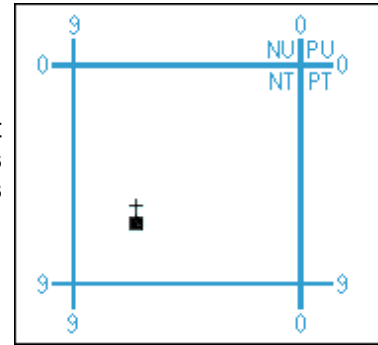


Figure 7 - 1/250 000 UTM grid

If, for some reason, a reference is required that is unique in the world, one must look in the margin of the map for the Grid Zone Designation. The zone, [which is explained elsewhere](#), is one of the 60 strips of the projection. The zone number is followed by a letter which gives the general area north or south of the equator in bands of 8 degrees. Therefore the unique designation of the church if it were in the Ottawa area would be **18 T NT9293**.

MGRS Identification Letter Corrections

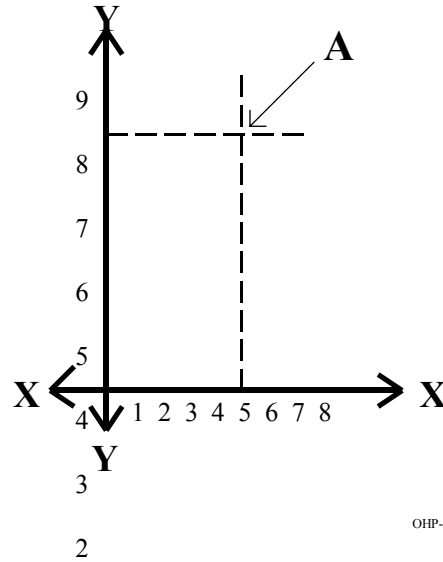
Many NRCan NTS map sheets have been produced with the **wrong two letter MGRS designators**. To view the corrections for this problem, see the following pages (on the website) provided by the Mapping and Charting Establishment of the Department of National Defense:

- [1/50 000 Scale](#)
- [1/250 000 Scale](#)

Principles of a Grid Reference

• **To find the position of A:**

1. Indicate the distance along the X axis (5)
2. Indicate the distance along the Y axis (8)
3. The combination of X-Y is the location of A. (5,8)



405.03 Silver Star

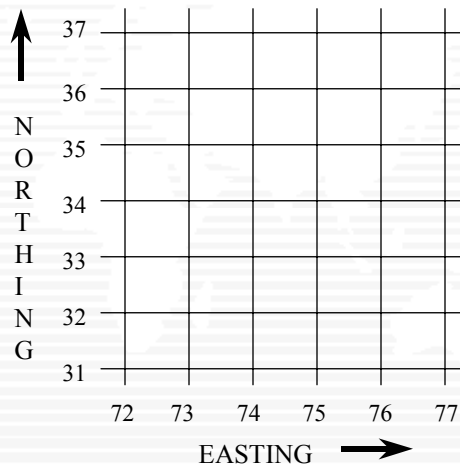
OHP-1

Principles of a Grid Reference

Eastings and Northings

Eastings run from North to South. They are numbered from 00 to 99 and read from left to right.

Northings run from East to West. They are numbered from 00 to 99 and read from top to bottom.



405.03 Silver Star

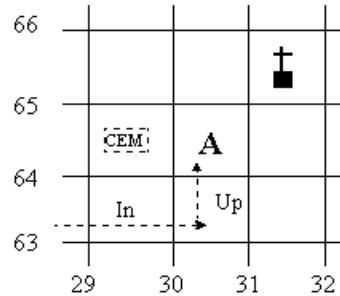
OHP-2

Order of Working a Grid Reference

1. The **Easting** is always the **first half** of the Grid Reference. This line forms the **west** side of the grid square.

2. The **Northing** is the **second half** of the GR. This line forms the **south** side of the grid square.

REMEMBER: In the house and up the stairs!!



EXAMPLE:

Location of A: **GR 3064**

EASTING

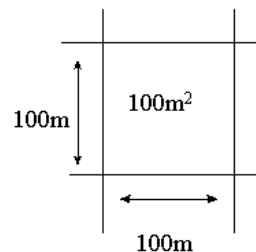
NORTHING

405.03 Silver Star

OHP-3

The Six-Figure Grid Reference

- A **6-figure grid reference** is a way of pinpointing a feature **within** a grid square.
- It is accurate to within **100 meters** and deals with **100m²** of ground.
- A 6-figure GR is used when:
 1. there are **2 or more** of the same feature in a grid square, and
 2. we need to be **exact** in giving a location.



405.04 Silver Star

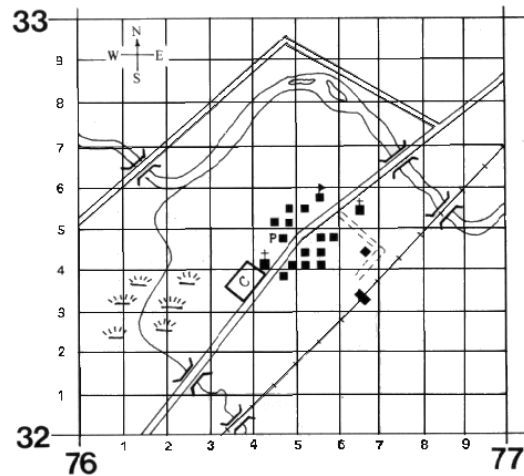
OHP-1

The Six-Figure Grid Reference

A 6-figure grid reference divides a grid square into **100** small squares.

Grid Square **7632** contains 5 bridges.

How will you know which one to go to?



405.04 Silver Star

OHP-2

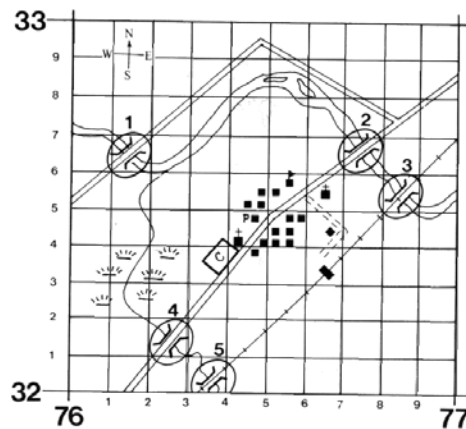
Taking A 6-Figure Grid Reference

Remember: “In the house, and up the stairs”

Bridge #1: 1 block east of **76**, 6 blocks north of **32**.

6-Figure GR for Bridge #1:

761326



405.04 Silver Star

OHP-3

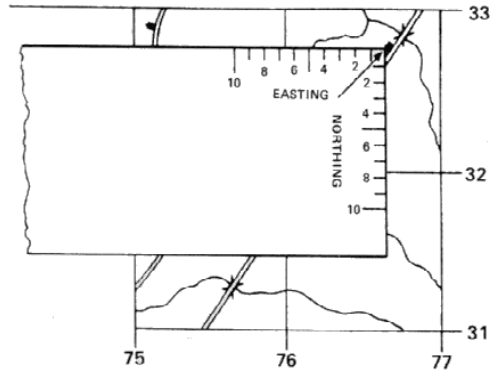
Use of a Romer

A **romer** is used to accurately measure a six-figure grid reference.

Place the corner of your paper on the landmark, and read off the 10ths.

Example: House

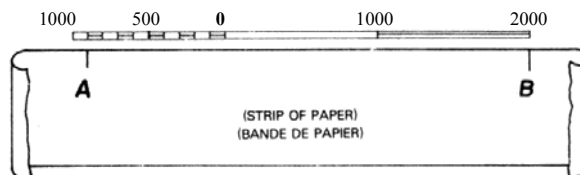
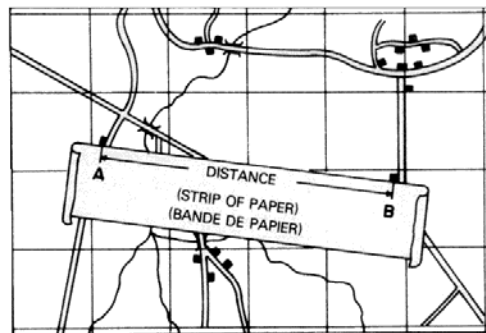
GR: 767328



405.04 Silver Star

OHP-4


MEASURING DISTANCE POINT-TO-POINT

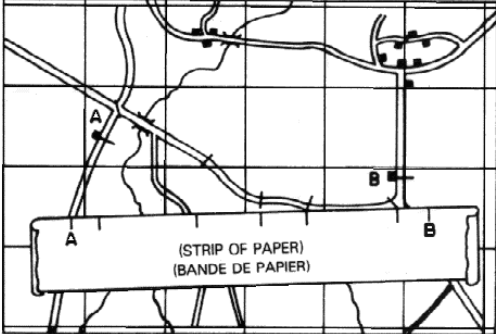


405.05 Silver Star

OHP-2

MEASURING DISTANCE ALONG A ROUTE



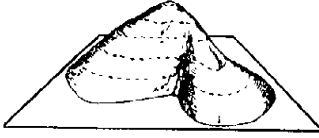



A road can be seen as a series of straight lines. Measure the first section, pivot your paper until it lines up with the second section, and repeat the process until you reach your destination.

405.05 Silver Star
OHP-3

CONTOUR LINES

- **A contour line is like a path.** If you walk around a hill at the same level, you are following a contour.
- By walking around the hill at a higher level, another contour is formed.
- A hill can also be cut into equally thick horizontal slices. The outline of each slice is a contour line.



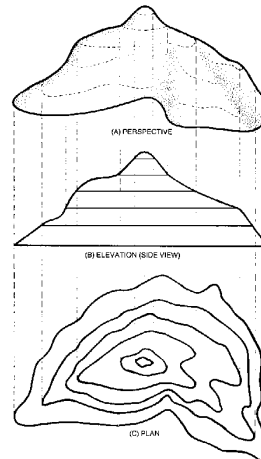


405.06 Silver Star
OHP-2

SHAPE OF THE GROUND

Every feature on the ground can be seen in 3 ways:

1. **Perspective:** appears as if seen from above
2. **Elevation:** Side-on view
3. **Plan:** shows the contour lines as they appear on a map.



405.06 Silver Star

OHP-3

SLOPES

1. Where the slope of a hill is **gentle**, the contour lines are spaced **far apart**.
2. Where the slope of a hill is **steep**, the contour lines are **close together**.
3. **Evenly spaced** contour lines mean a **uniform** slope.



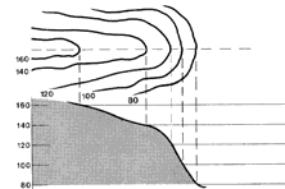
405.06 Silver Star

OHP-4

CONTOUR PATTERNS (1)

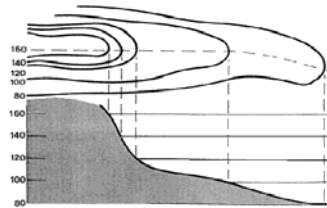
CONVEX SLOPES:

The hill is steep at the bottom and flattens out near the top.



CONCAVE SLOPES:

The slope is gentle at the bottom of the hill and gets steep as you near the top.

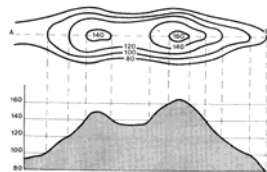


405.06 Silver Star

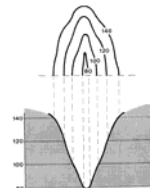
OHP-5

CONTOUR PATTERNS (2)

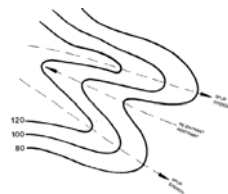
Ridge with a Saddle



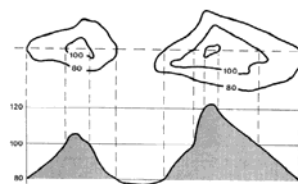
Valleys



Spurs with Re-entrant



Separate Hills



405.06 Silver Star

OHP-6

QUIZ 2

(Use map at Annex A to answer the following questions)

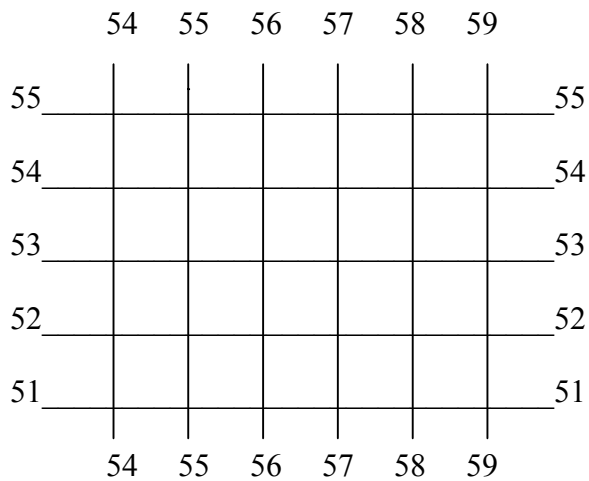
1) Look at the numbering of the blue grid lines in the margin of the map. Circle any correct statements below. The numbers increase as they go from....

a.) left to right
c.) top to bottom

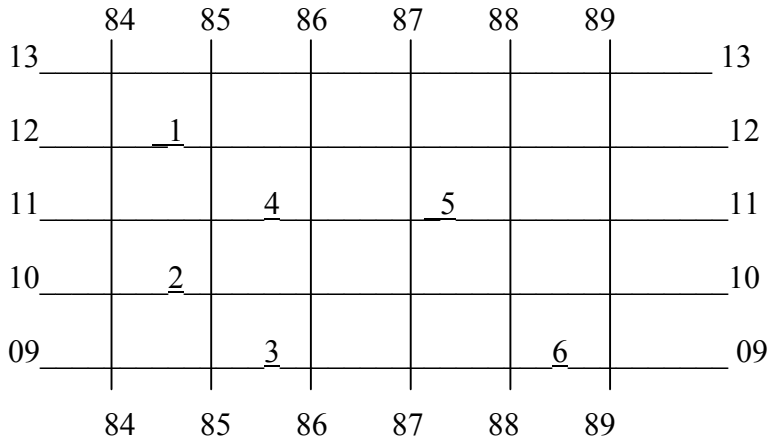
b.) right to left
d.) bottom to top

2) Examine your map and see how the grid lines form squares similar to the diagram below.

Shade in grid squares 5852, 5451, and 5654 on this worksheet (not on the map).



3) Give the grid square for the various numbers placed on the grid in the diagram below.



- #1 is in Grid square _____
- #2 is in Grid square _____
- #3 is in Grid square _____
- #4 is in Grid square _____
- #5 is in Grid square _____
- #6 is in Grid square _____

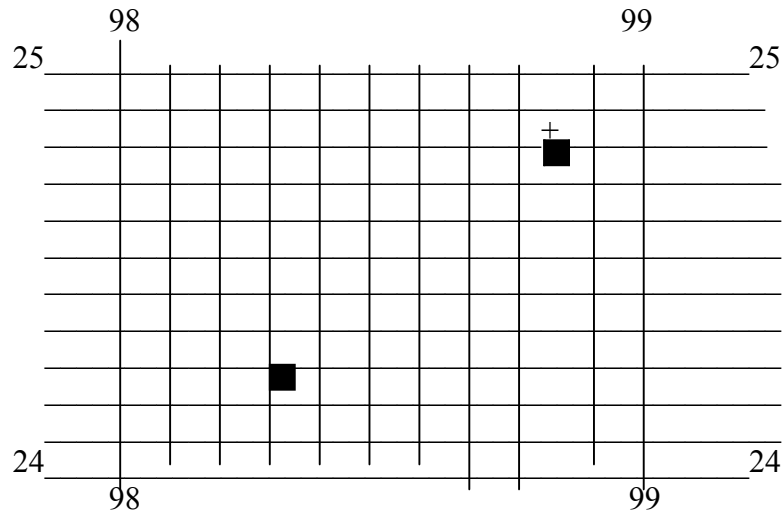
4) On your map, what names or places appear in the following grid squares?

- a.) 4454 _____
- b.) 4251 _____
- c.) 5344 _____
- d.) 4445 _____

5) Using information for conventional signs contained in the margin in your map, list any three man-made or natural features found in each of the following locations.

- a. Grid square 4345 _____
- b. Grid square 5448 _____
- c. Grid square 4146 _____
- d. Grid square 5345 _____

6) What is the grid reference for the house in the diagram below? _____



7) Look at your map. List what is located at the following six figure grid references? Do this by estimation (not using a romer).

a. GR 444546

b. GR 548488

c. GR 499466

d. GR 406485

8) Measure the distance (in a straight line) between each of the following grid references.

a. GR 395469 to GR 493531 (in meters)

- b. GR 444546 to GR 499521 (in meters)

9) Measure the distance (on the road) between each of the following grid references.

- a. from road junction at GR 416469 to road junction at GR 431495
- b. from 'Y' junction in road at GR 499465 to road junction at GR 539453

10) With an X, indicate the correct statement(s) below.

- a. Contours are lines on a map that follow a certain level throughout their length.

- b. Contours are lines on a map that go up hill and down hill throughout their length. _____

- c. Both of the above statements are true. _____

- d. Neither of the above statements are true. _____

Unit 8 – Assignment

(Use map at Annex B to complete the assignment)

Identify the features found at the following grid references and circle the correct answer.

1. What is at grid reference 682367?
 - a. School
 - b. Railroad bridge
 - c. Water tower
 - d. Church

2. What is at grid reference 621297?
 - a. School
 - b. Railroad bridge
 - c. Water tower
 - d. Church

3. What is the grid reference of the water tower located southwest end of Cutlus Lake?
 - a. GR 311717
 - b. GR 317711
 - c. GR 711317
 - d. GR 717311

4. What is the grid reference of the communication tower in the center of the Columbia Valley?
- a. GR 693305
 - b. GR 695303
 - c. GR 305693
 - d. GR 303695
5. Your section is going on a route march from GR 693364 to GR 695357. What is the total elevation between those two points?
- a. 100 m
 - b. 120 m
 - c. 140 m
 - d. 220 m
6. What is the distance in meters from the 'T' junction GR 697370 to the road junction at GR 665333 along the road of the most direct route?
- a. 4,300 m
 - b. 4,800 m
 - c. 5,800 m
 - d. 6,200 m
7. What is the distance in meters as the crow flies from the road junction at GR 613313 to the road junction at GR 616362?
- a. 6,000 m
 - b. 6,900 m
 - c. 7,500 m
 - d. 8,000 m

8. What is the difference in height above sea level between the house at GR 591363 and the communication tower located at GR 695303?

- a. 20 m
- b. 40 m
- c. 240 m
- d. no difference

9. What is the elevation above sea level of the building at GR 656304?

- a. 800 m
- b. 420 m
- c. 560 m
- d. 240 m

10. What is the distance in meters from road junction at GR 577449 to road junction at GR 669456 along the road of the most direct route?
(+/- 100 m)

- a. 10,300 m
- b. 13,000 m
- c. 14,500 m
- d. 11,500 m

UNIT 9
MAP AND COMPASS
Orient a Map Using a Compass

1. This unit should take you 2 hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. You need get a mark of 100% before moving on to the next unit. If you get any lower than 100% you should complete all the reading, activities, and exercises in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 5-37 to 5-42
- b. Additional Reading Included (slides)

3. Activities and Exercise:

- a. Complete Unit 9 – Quiz 1, then check your answers. If you get 100% on this quiz, move on and complete the Unit 10 Assignment. If you do not get at least 100%, review the areas where you had difficulty and complete Quiz 2 & Quiz 1 again. If you need further assistance, ask your Training Officer for additional help.
- b. Complete Unit 9 – Quiz 2, then check your answers.

4. Unit 9 Assignment: This unit's assignment is a 10 question multiple-choice quiz. The questions are very similar to the type you will find on the Map & Compass Written Exam. You should complete the quiz without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.

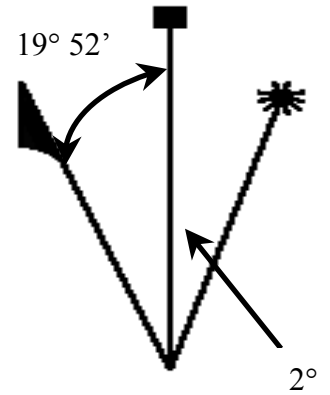


You will have to calculate declination both on the written exam and on the practical test. You must calculate the declination correctly on the practical test to pass. You may use a calculator on both the written and practical test, however you will have to provide your own.

QUIZ 1

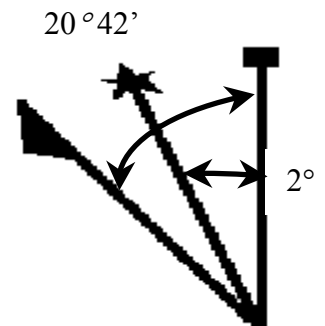
1. Calculate the Magnetic Declination. Show all your work.

- annual change 5' decreasing
- present year 2002
- map year 1985



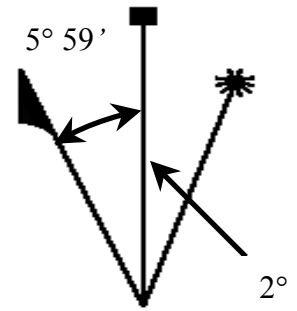
2. Calculate the Magnetic Declination. Show all your work.

- annual change 10' decreasing
- present year 2002
- map year 1999



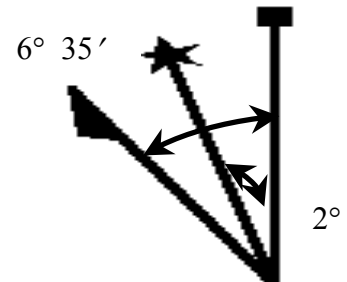
3. Calculate the Magnetic Declination. Show all your work.

- annual change 5' increasing
- present year 2002
- map year 1996



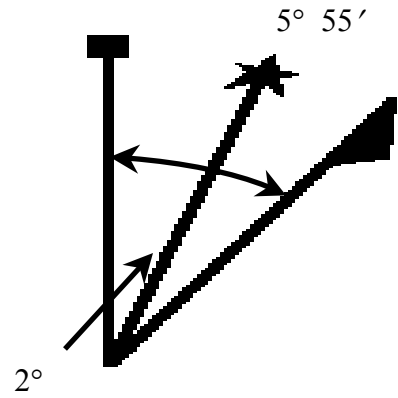
4. Calculate the Magnetic Declination. Show all your work.

- annual change 5' increasing
- present year 2002
- map year 1998



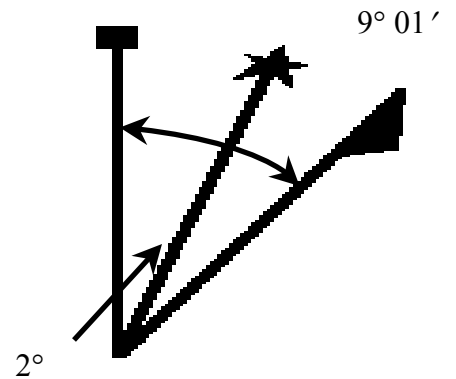
5. Calculate the Magnetic Declination. Show all your work.

- annual change 15' decreasing
- present year 2002
- map year 1995



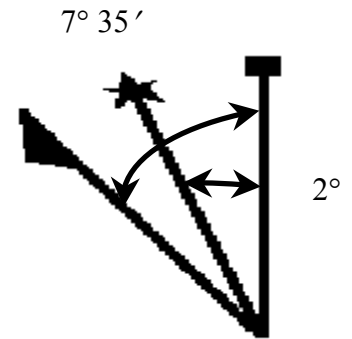
6. Calculate the Magnetic Declination. Show all your work.

- annual change 5' increasing
- present year 2002
- map year 1997



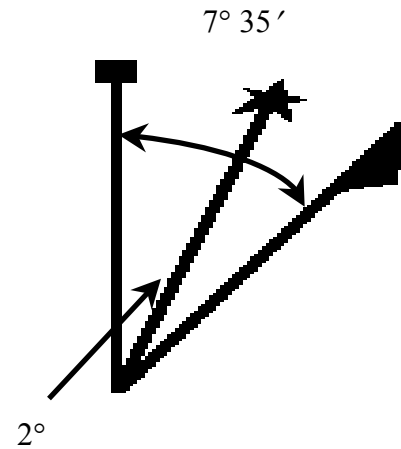
7. Calculate the Magnetic Declination. Show all your work.

- annual change 5' increasing
- present year 2002
- map year 1990



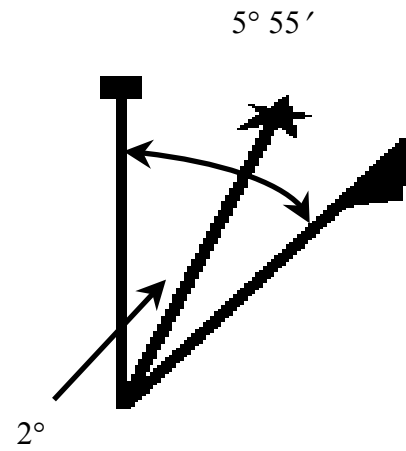
8. Calculate the Magnetic Declination. Show all your work.

- annual change 7' decreasing
- present year 2002
- map year 1993



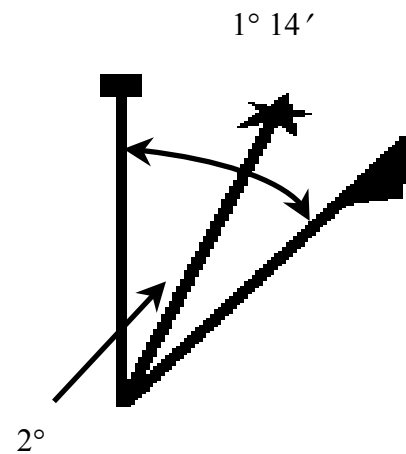
9. Calculate the Magnetic Declination. Show all your work.

- annual change 6' increasing
- present year 2002
- map year 1990



10. Calculate the Magnetic Declination. Show all your work.

- annual change 10' decreasing
- present year 2002
- map year 1980



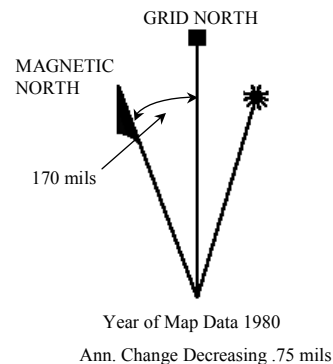
UNIT 9 SUPPLEMENTAL READING

ANNUAL MAGNETIC CHANGE

The amount of declination for any area will change slightly every year. This difference is called **the annual magnetic change**. The older the map, the less accurate the information.

We can account for this change by using information found on the map:

1. **Year when map data was last updated**
2. **Annual magnetic change**
3. **Declination when map data was accurate**



405.01 Gold Star

OHP-1

STEPS IN CALCULATING MAGNETIC DECLINATION

STEP A: Subtract the year of the map data from the present year.	$\begin{array}{r} 1997 \\ - 1980 \\ \hline 17 \end{array}$
STEP B: Multiply the answer from Step A by the annual magnetic change.	$\begin{array}{r} 17 \\ \times .75 \text{ mils} \\ \hline 12.75 \text{ mils} \end{array}$
STEP C: If the annual change is increasing , add the answer from Step B to the declination when the map data was accurate. If the annual change is decreasing , subtract .	$\begin{array}{r} 170.00 \text{ mils} \\ - 12.75 \text{ mils} \\ \hline 157.25 \text{ mils} \end{array}$

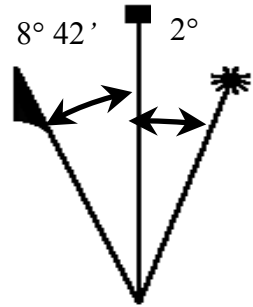
405.01 Gold Star

OHP-2

Quiz 2

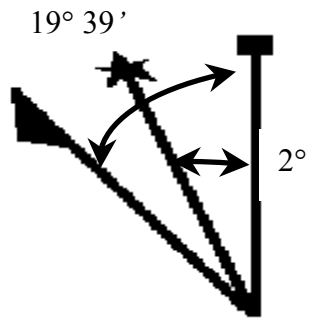
1. Calculate the Magnetic Declination. Show all your work.

- *annual change 5' increasing*
- *present year 2004*
- *map year 1986*



2. Calculate the Magnetic Declination. Show all your work.

- *annual change 5' increasing*
- *present year 2004*
- *map year 1997*



3. Calculate the Magnetic Declination for a 1995 map that has a declination of $21^{\circ} 52'$ E and a decreasing annual change of $10'$. (Calculate using 2004 as the current year)

4. Calculate the magnetic declination for a 1990 map that has a declination of $1^{\circ} 30'$ W and an increasing annual change of $10'$. (Calculate using 2004 as the current year)

5. Calculate the magnetic declination for a 1987 map that has a declination of $12^{\circ} 35'$ W and an increasing annual change of $7'$. (Calculate using 2004 as the current year)

6. Calculate the magnetic declination for a 1999 map that has a declination of $5^{\circ} 55'$ W and a decreasing annual change of $7'$. (Calculate using 2004 as the current year)

7. Calculate the magnetic declination for a 1997 map that has a declination of $18^{\circ} 40'$ E and a decreasing annual change of $15'$. (Calculate using 2004 as the current year)

8. Calculate the magnetic declination for a 1993 map that has a declination of $3^{\circ} 45'$ W and an increasing annual change of $15'$. (Calculate using 2004 as the current year)

9. Calculate the magnetic declination for a 1998 map that has a declination of $3^{\circ} 35'$ E and an increasing annual change of $5'$. (Calculate using 2004 as the current year)

10. Calculate the magnetic declination for a 1981 map that has a declination of $14^{\circ} 42'$ W and a decreasing annual change of $5'$. (Calculate using 2004 as the current year)

UNIT 9 – ASSIGNMENT

1. What is the magnetic declination for a map dated 1989, with a declination of $10^{\circ} 35' E$ and an annual change of $5'$ increasing? (Calculate using 2004 as the current year)
 - a. $9^{\circ} 20' E$
 - b. $11^{\circ} 50' W$
 - c. $11^{\circ} 50' E$
 - d. $9^{\circ} 20' W$

2. What is the magnetic declination for a map dated 2000, with a declination of $21^{\circ} 45' W$ and an annual change of $10'$ decreasing? (Calculate using 2004 as the current year)
 - a. $21^{\circ} 05' W$
 - b. $21^{\circ} 05' E$
 - c. $22^{\circ} 25' E$
 - d. $22^{\circ} 25' W$

3. What is the magnetic declination for a map dated 1994, with a declination of $12^{\circ} 55' E$ and an annual change of $10'$ increasing? (Calculate using 2004 as the current year)
 - a. $11^{\circ} 15' E$
 - b. $11^{\circ} 15' W$
 - c. $14^{\circ} 35' E$
 - d. $13^{\circ} 15' W$

4. What is the magnetic declination for a map dated 1999, with a declination of $19^{\circ} 25' W$ and an annual change of $15'$ decreasing? (Calculate using 2004 as the current year)
- a. $20^{\circ} 40' E$
 - b. $18^{\circ} 10' W$
 - c. $18^{\circ} 10' E$
 - d. $20^{\circ} 40' W$
5. What is the magnetic declination for a map dated 1993, with a declination of $1^{\circ} 14' E$ and an annual change of $5'$ increasing? (Calculate using 2004 as the current year)
- a. $1^{\circ} 24' E$
 - b. $1^{\circ} 24' W$
 - c. $2^{\circ} 9' W$
 - d. $2^{\circ} 9' E$
6. What is the magnetic declination for a map dated 1998, with a declination of $13^{\circ} 27' W$ and an annual change of $10'$ decreasing? (Calculate using 2004 as the current year)
- a. $14^{\circ} 27' E$
 - b. $14^{\circ} 27' W$
 - c. $12^{\circ} 27' W$
 - d. $12^{\circ} 27' E$

7. What is the magnetic declination for a map dated 1991, with a declination of $6^{\circ} 59' E$ and an annual change of $15'$ increasing? (Calculate using 2004 as the current year)
- a. $2^{\circ} 45' E$
 - b. $2^{\circ} 45' W$
 - c. $10^{\circ} 14' W$
 - d. $10^{\circ} 14' E$
8. What is the magnetic declination for a map dated 1997, with a declination of $7^{\circ} 46' W$ and an annual change of $5'$ increasing? (Calculate using 2004 as the current year)
- a. $7^{\circ} 11' W$
 - b. $7^{\circ} 11' E$
 - c. $8^{\circ} 21' W$
 - d. $8^{\circ} 21' E$
9. What is the magnetic declination for a map dated 1992, with a declination of $9^{\circ} 41' E$ and an annual change of $10'$ increasing? (Calculate using 2004 as the current year)
- a. $11^{\circ} 41' W$
 - b. $11^{\circ} 41' E$
 - c. $7^{\circ} 41' W$
 - d. $7^{\circ} 41' E$

10. What is the magnetic declination for a map dated 2001, with a declination of $12^{\circ} 39' W$ and an annual change of $5'$ decreasing? (Calculate using 2004 as the current year)

- a. $12^{\circ} 54' W$
- b. $12^{\circ} 54' E$
- c. $12^{\circ} 24' W$
- d. $12^{\circ} 24' E$

UNIT 10
MAP AND COMPASS
Measuring a Grid Bearing

1. This unit should take you 2 hours to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 100%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 100% you should complete all the reading, activities, and exercised in this unit.

2. Reading:

- a. Army Cadet Reference Book, Pages 5-50 to 5-52

3. Activities and Exercise:

- a. Complete Unit 10 – Quiz 1, then check your answers. If you get 100% on this quiz, move on and complete the Unit 10 Assignment. If you do not get at least 100%, review the areas where you had difficulty and complete Activity A & Quiz 1 again. If you need further assistance, ask your Training Officer or your Gold Star Officer for additional help.

- b. Complete Unit 10 – Activity A, then check your answers.

4. Unit 10 Assignment: This unit's assignment is a practical activity. It is identical to the requirement on the practical map and compass test. You must pass this skill in order to pass the map and compass skills test. You should complete the assignment without referring to any reference material. Once completed, turn it into your Training Officer who will mark the assignment and return it to you to make any corrections.



You will be required to use a compass when tested on this skill. Practice with a compass, not a protractor.



This is a skill test only; you will not find any questions from this section on the written exam.

QUIZ 1

Using map at Annex C, measure the grid bearing using a compass from point A to point B.

1. Point A – 035693
Point B – 068744 _____

2. Point A – 068744
Point B – 104724 _____

3. Point A – 104724
Point B – 035693 _____

4. Point A – 148772
Point B – 151739 _____

5. Point A – 130691
Point B – 091704 _____

QUIZ 2

Using map at Annex C, measure the grid bearing using a compass from point A to point B.

1. Point A – 168746
Point B – 187772 _____

2. Point A – 187772
Point B – 156774 _____

3. Point A – 156774
Point B – 156765 _____

4. Point A – 156765
Point B – 177751 _____

5. Point A – 177751
Point B – 168746 _____

UNIT 10 – Assignment

Using map at Annex D, measure the grid bearing using a compass from point A to point B.

1. Point A – 983920
Point B – 014934 _____

2. Point A – 014934
Point B – 006982 _____

3. Point A – 006982
Point B – 046988 _____

4. Point A – 046988
Point B – 058947 _____

5. Point A – 058947
Point B – 015928 _____

UNIT 11
MAP AND COMPASS
Orient a Map by Inspection

1. This unit should take you --- hour to complete. Start by completing quiz 1 and then mark it, using the marking grid at the back of the book. If you get 100%, you should feel comfortable enough to complete the Unit Assignment and then move on to the next unit. If you get any lower than 100% you should complete all the reading, activities, and exercised in this unit.

2. Reading:

a. Army Cadet Reference Book, Pages 5-20

3. Activities and Exercise:

a. Nil

4. Unit 12 Assignment: This unit's assignment is a practical activity that must be assigned by your corps' Trg O. You will be required to orient a map by inspection on the practical map and compass test. You must pass this skill in order to pass the map and compass skills test. Have your Trg O provide you with a map of your local area and have him confirm that you have oriented the map correctly.



This is a skill test only; you will not find any questions from this section on the written exam.

UNIT 12

Bushcraft Skills Test – Knots

1. This unit should take you two hours to complete; however you should revisit this unit a few times through out the training year and continue to practice what you have learned. The knots portion of the exam is a test of skill; therefore, before you start this unit you will need to have rope. Once you have all the materials on hand, start by reading the reference material, checking out some of the websites, as well as looking at the information and pictures included in these next few pages. Then complete Activity A, if you get anything less than 100%, review the material again before moving on. Once you feel confident, test yourself by completing Activity B, and then your unit Assignment.

2. Reading:
 - a. Army Cadet Reference Book, Pages 3-42 to 3-46
 - b. Army Cadet Reference Book, Pages 3-56 to 3-57
 - c. Unit 12 Supplemental Reading (included)
 - d. <http://www.mistral.co.uk/42brghtn/knots/42ktmenu.html>
 - e. <http://www.korpegard.nu/knot>

3. Activities and Exercises:
 - a. Complete Unit 12 Activity A (numbers 1 through 10), then check your answers.

 - b. Complete Unit 12 Activity B, Using all of the knots that you listed in question one of the activity; tie each knot *without* using the reference material, as a final test for yourself. You must be able to complete *all* knots successfully because you will be tested on all five and you must know every one of the knots. Anything less than 100% is considered a fail on the skills test. If you need further assistance, be sure to ask your Training Officer for additional help.

4. Unit 12 Assignment: This unit's assignment is to complete all of the knots without reference to any of the study material. Once you feel that you can sufficiently accomplish tying all of the knots as well as defining their use, make an appointment with your training officer to be tested on each one of the knots. If your training officer is not available, contact any one of the other officers in your corps to assist you in testing for this assignment. If you do not receive 100% on this assignment, it is recommended that you *not* move on to another unit unless this has been accomplished.



The web pages listed have some excellent animated knots. Visit the site and you will be able to see the knot being tied.







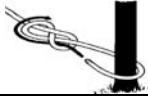
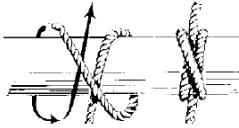


You must tie all of the five listed knots correctly to pass the test.

- Clove hitch
- Double figure of eight
- Reef knot
- Bowline
- Fisherman's

Activity A

Cut each of these squares out and place it in the correct spot in the table below.

to anchor a rope around a tree trunk, pole or such item.	to keep the end of a rope from unraveling, or to stop a rope from passing through an eye	Figure Eight Knot		
	Double Figure of Eight Knot	used to join fishing line and ropes together:	to secure a rope to a spar, rail or similar fitting.	
Bowline	Half Hitch	called the rescue knot as it makes a simple loop that does not slip.		

USE	NAME	PICTURE
	Thumb Knot	
same uses as the thumb knot,		
		
for joining two ropes of equal thickness.		
	Clove Hitch	
used whenever the end of a rope is to be fastened around a spar or ring.		
		
	Fisherman's knot	

Summary of Important Points from the Reference Book Knots and Lashings Skills Test

Types of Ropes

- ropes are made with either natural or synthetic fibers
- most common natural fibers are cotton and hemp
- most common synthetic fibers are nylon and polypropylene
- ropes can be manufactured using laid, woven, kernmantle or sash methods

Care of Ropes

- do not step on them
- keep them clean and dry
- always inspect a rope for damage both before and after use

Knots

- clove hitch
- double figure eight (re-woven)
- reef
- bowline
- fisherman's



*You will have to tie
the double figure of
eight around a pole.
Make sure you
practice tying the
RE-WOVEN figure
of eight.*

UNIT 12 SUPPLEMENTAL READING

THE CLOVE HITCH

USE: To secure a rope to a spar, rail or similar fitting

1. Pass the running end of rope over the rail from front towards the back



2. Bring the running end under the rail and over the standing end towards the left



3. Bring the running end over spar to the left



4. Bring the running end out under the rail and thread it up under the rope on the rail by the crossover



5. Work the hitch tight with the running end and the standing end sung against each other

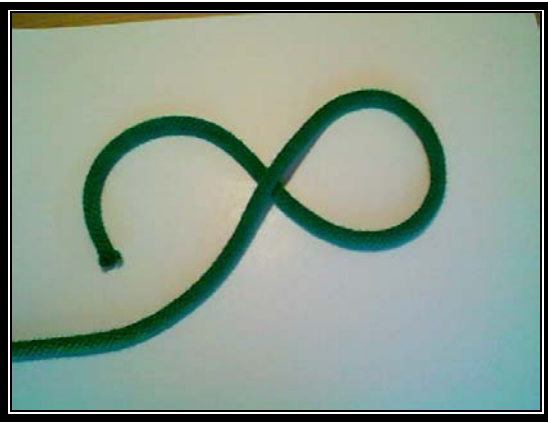


THE DOUBLE FIGURE OF EIGHT (RE-WOVEN)

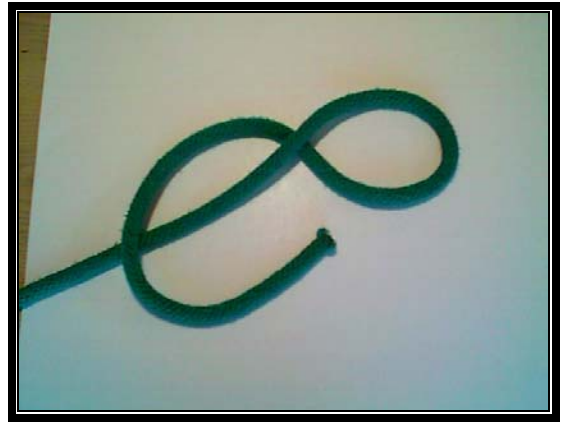
USE: To anchor a rope around a tree trunk, pole or other such item.

First tie a figure of eight. (Make sure you tie it far enough down the rope to be able to weave it back through)

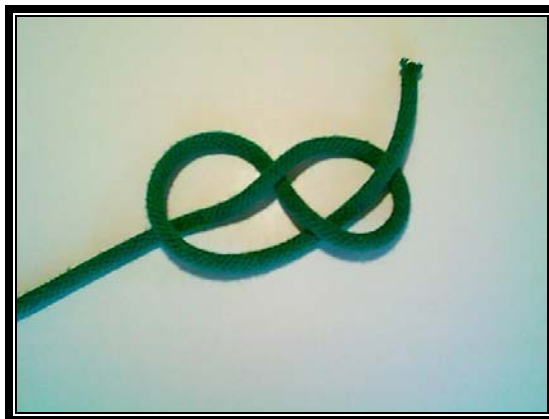
1. Start by forming a loop with the running end passing under the standing end, and then make a bight in the running end.



2. Pass the running end (across) in front of the standing end then thread it through the loop from the back.



3. The knot should now have the figure eight which gives it its name.



ONCE YOU HAVE TIED YOUR FIGURE OF EIGHT, WEAVE THE STANDING END BACK THROUGH THE KNOT.

1. Begin with a loose figure of eight knot.



2. Guide the running end back up through the loop it just came down through (notice: loop at left- do not pull it tight).



3. Have the running end trace alongside the rope in the original figure of eight under the standing end.



4. Have the running end follow the original figure of eight under the double rope.



5. The running end follows the original figure of eight (notice: the loop stays open at the left)



6. Pull tight, dress knot by flattening it and making sure the ropes are side by side (notice loop at left).



BOWLINE

Use: To tie around yourself or to throw to someone who needs a lifeline (or to tie to the bow of a ship). It can also be called a rescue knot because it makes a simple knot that does not slip.

Hint: - a saying that helps with this knot is ‘a rabbit comes out of his hole, goes around the tree and back down into the same hole that he came out of’. The rabbit is at the end of the string, the hole is the loop, and the tree is the remainder of the string sticking up.

1. Make a loop with the running end passing over the standing end and turn the end back towards the loop (looks like a number six)



2. Pass the running end through the loop from the back, then pull the running end through the loop and turn it behind the standing end.



3. Bring the running end around and back to the front loop, thread the running end through the front of the loop.



4. With the running end through the loop, hold the running end against the inside of the right side of the bight and pull on the standing end.



*Be careful to ensure that you bring the running end down on the **INSIDE** of the loop. If you tie it with the running end on the outside, you have tied a cowboy bowline and it will be marked wrong!*

FISHERMAN'S KNOT

Use: To join two pieces of rope of equal diameter.

Hint: Formed from two overhand knots that are pushed together so that the running ends lie in opposite direction. Ensure that the ears (running ends) point in opposite directions and have one on top and one on bottom

1. lay the running ends of two lines side by side so they point in opposite directions. With the running ends of one line, start the first of the Overhand Knots by taking a turn around the second line.



2. Complete the first Overhand knot around the second line and work it fairly tight, while keeping enough slack for the second line to slide through



3. Start making an Overhand knot in the running end of the second rope around the standing part of the first rope. Make sure the running end crosses over in front of the first line



4. Take the running end completely around the first line and back through the loop to form the second of the Overhand knots.



5. Complete the knot so that the running ends point in the opposite direction to that of the first knot, pull both knots snug up against each other



THE REEF KNOT

Use: For joining two ropes of equal thickness

Hints: Notice that when done right, the running end and the standing end of one rope come out on the same side of the bight formed by the other rope. Called the opposite knot so to tie this knot remember 'left over right and right over left'

1. Take the running ends of two different ropes and place the left-hand end across the right end.



2. Tuck the left hand end under, and back up over the right end.



3. Bring the two ends together again and place the right-hand end over the left hand one.



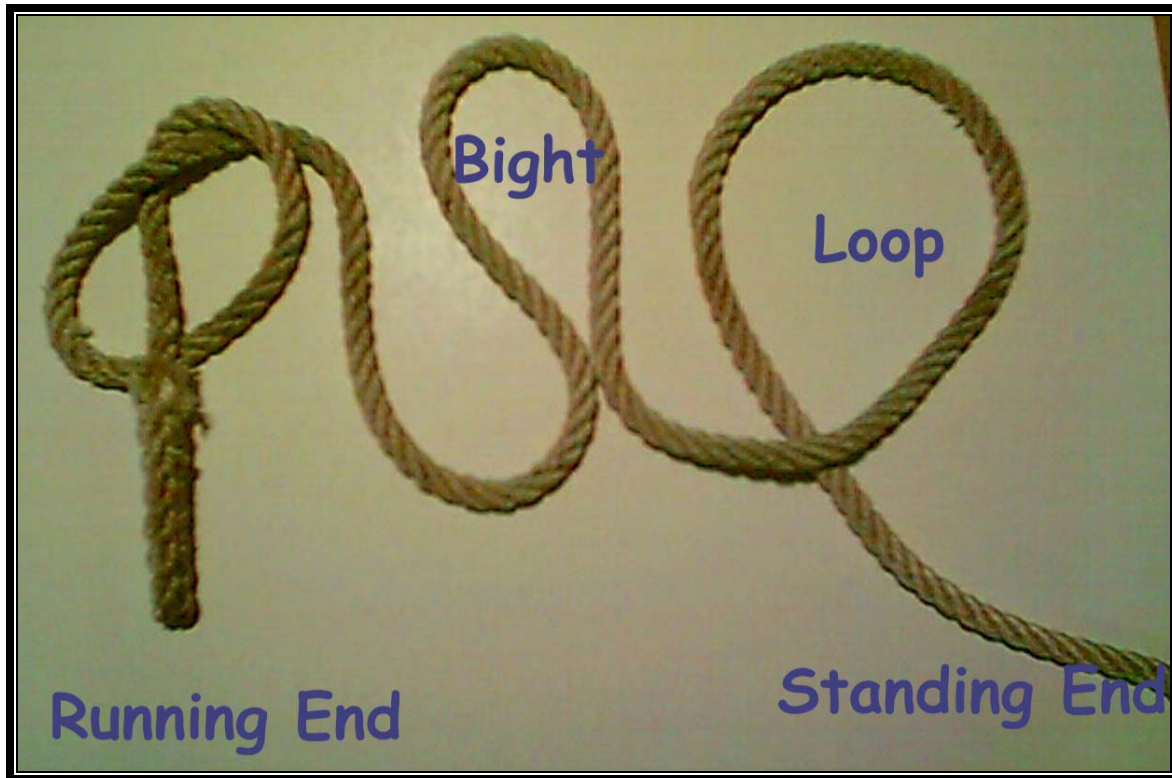
4. Tuck the right hand end under and back up over the left hand end.



5. Dress the knot by pulling on both ends



ROPE TERMINOLOGY



RUNNING END: The part of the rope that is being moved or formed.

BIGHT: A curved part of the rope that can be a wide or narrow curve and may touch at the base.

LOOP: A formed when the rope passes over itself.

STANDING END: The remainder of the rope that is not directly involved in the knot.

UNIT 12 ASSIGNMENT

Bring this sheet with you to cadets, and have the Training Officer test you on all of the knots and lashings. You must be able to complete all the knots, and explain what they are used for, without any of the reference material. Once you have passed all of the knots and the Training Officer has signed all the spaces on your sheet, you may continue to the next unit.

KNOT	SIGNATURE	COMMENTS
Clove Hitch		
Double Figure Eight (re-woven)		
Reef		
Bowline		
Fisherman's		

UNIT 13

Instructional Techniques – Classroom Instruction

1. This unit should take you 4 hours to complete. The instructional technique portion of the exam is practical and consists of two tests; the first one being the classroom lesson. Start by reviewing the reading material in the reference book, and then move on to the activities and exercises. You must complete all sections of this unit to be fully prepared for the IT test.
2. Reading:
 - a. Army Cadet Reference Book, Pages 9-1 to 9-20
 - b. Supplemental reading and charts provided.
3. Activities and Exercises:
 - a. Complete Unit 13 - Activity 1, then check your answers
 - b. Complete Unit 13 – Activity 2. If you get 70% or higher on your lesson, move on and complete the unit 14 assignment. If you do not, ask your Trg O to assign another lesson and complete Activity 1 and 2 again.
4. Unit 13 Assignment: This final assignment for this unit will take place in two parts. Both of which cannot be finished until about 2 weeks before the national exam takes place. This is when you will receive the actual classroom lesson you will be teaching at the NSCE exam. The first part of the assignment will be to prepare for this lesson, and the second part will be to teach it before you arrive at the test. Part one will include your lesson plan, training aids and anything else that you will require and must be checked by your training officer before attempting part two. Once you are prepared, you will teach the lesson, and be assessed on it. If there is time, teach it again a second time before arriving at NSCE, or at least practice it again at home.



You must achieve a minimum of 60% on the classroom lesson to pass.

Activity 1

This activity will require you to watch the video titled The Class Lecture. You will need to get this video from your corps' training officer. You will need to either, sign the video out and take it home to watch it, or, you will have to make arrangements with your training officer to watch it on a cadet night.

The instructions for this activity are as follows:

1. Watch the video once through, taking note of both the positive and negative points of lecture (including proper format, instructors voice etc.)
2. Watch the video a second time, this time using the page provided, list what you think the strong, and the weak points are as you go along
3. If possible, compare and discuss the answers with a fellow NSCE candidate
4. Check and correct your answers

THE CLASS LECTURE

STRENGTHS	WEAKNESSES

CLASSROOM INSTRUCTION MONITORING GUIDE

Name: _____ Date: _____ Cadet Corps: _____

Lesson to be Taught: _____ Evaluator: _____

<u>PREPARATION FOR LESSON</u>	SUB-TOTALS	TOTALS
Did the Instructor: a. have a useful lesson plan? b. choose an appropriate classroom/training area? c. prepare and check training aids?	/10 /5 /5	 /20
<u>INTRODUCTION</u>		
Did the Instructor: a. introduce him/herself? b. state what the cadet will learn? c. tell the cadet why it was important? d. tell the cadet where it fits into the overall training plan? e. carry out a review of a previously related lesson? f. establish class interest?	/1 /1 /2 /2 /2 /2	 /10
PRESENTATION		
Did the Instructor: a. start teaching at a level of comprehension? b. identify teaching points? c. give clear explanations? demonstrations? d. use training aides? e. use a logical sequence?	/2 /2 /8 /8 /5	 /25

<u>CLASS ACTIVITY</u>	SUB-TOTALS	TOTALS
Did the Instructor: a. provide constructive class participation? b. help students who were experiencing difficulty? c. correct errors immediately? d. control the class?	 /8 /5 /8 /4	 /25
<u>CONFIRMATION</u>		
Did the Instructor: a. evaluate learning by states? b. confirm the main teaching points?	 /5 /5	 /10
<u>TEST</u>		
Did the Instructor: a. test cadets on the main teaching points? b. confirm the main teaching points?	 /3 /2	 /5
<u>CONCLUSION</u>		
Did the Instructor: a. summarize effectively?	 /5	 /5
<u>FINAL SCORE</u>	<u>TOTAL</u>	/100
EVALUATOR'S COMMENTS: (List the strengths of the lesson and the areas of improvement.) <div style="text-align: right;"> _____ Evaluator's Signature </div>		

HOW TO GET FULL MARKS ON THE CLASSROOM LECTURE

<u>PREPARATION FOR LESSON</u>	PREPARATION FOR LESSON
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. have a useful lesson plan? b. choose an appropriate classroom/training area? c. prepare and check training aids? 	<ul style="list-style-type: none"> a. lesson plan must have an intro, body with stages, concl, and timings (<i>2 marks each</i>) b. appropriate classroom configuration (<i>5marks</i>), deducted from there if done somewhat, depending on the situation (<i>4-1 marks</i>) c. training aids are prepared, and checked (<i>5marks</i>), deducted from there if done somewhat, depending on the situation (<i>4-1 marks</i>)
<u>INTRODUCTION</u>	INTRODUCTION
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. introduce him/herself? b. state what the cadet will learn? c. tell the cadet why it was important? d. tell the cadet where it fits into the overall training plan? e. carry out a review of a previously related lesson? f. establish class interest? 	<ul style="list-style-type: none"> a. instructor says who they are (<i>1 mark</i>) b. performance statement/what (<i>1 mark</i>) c. reason stated/ why, must be said to class not just written (<i>2 marks</i>) d. where it is applied and fits into the training plan, must be said to class not just written (<i>2 marks</i>) e. carry out any sort of review, or lack of it, must be said to class, not just written (<i>2 marks</i>) f. if the overall delivery and approach of introduction establishes interest (<i>2 marks</i>)
<u>PRESENTATION</u>	PRESENTATION
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. start teaching at a level of comprehension? b. identify teaching points? c. give clear explanations? demonstrations? d. use training aides? e. use a logical sequence? 	<ul style="list-style-type: none"> a. work from the known to the unknown and use of appropriate language (<i>1 mark each</i>) b. identify the MTPs both verbally and visually (<i>1 mark each</i>) c. each MTP has an explanation, demonstration and imitation, use of CREST, full marks if all of these are iclud. (<i>8 marks or 2 marks each</i>) marks deducted if done somewhat (<i>6-1 marks</i>) d. quality (<i>3 marks</i>), appropriateness (<i>2 marks</i>), effective use of (<i>3 marks</i>) e. must have organization and flow (<i>5 marks</i>)

HOW TO GET FULL MARKS ON THE CLASSROOM LECTURE

<u>CLASS ACTIVITY</u>	<u>CLASS ACTIVITY</u>
<p>Did the Instructor:</p> <p>a. provide constructive class participation?</p> <p>b. help students who were experiencing difficulty?</p> <p>c. correct errors immediately?</p> <p>d. control the class?</p>	<p>a. use of good question technique (3 marks), posing questions to class, appropriate practices based on timings and stages (5 marks)</p> <p>b. re-explanation of points, reaction to confused students (5 marks)</p> <p>c. instructor initiated (8 marks)</p> <p>d. effective class control (4 marks)</p>
<u>CONFIRMATION</u>	<u>CONFIRMATION</u>
<p>Did the Instructor:</p> <p>a. evaluate learning by states?</p> <p>b. confirm the main teaching points?</p>	<p>a. must be a review at the end of each stage and time for questions (5 marks)</p> <p>b. review of each stage must cover ALL teaching points in that stage (5 marks)</p>
<u>TEST</u>	<u>TEST</u>
<p>Did the Instructor:</p> <p>a. test cadets on the main teaching points?</p> <p>b. confirm the main teaching points?</p>	<p>a. did the test cover what material is was supposed to (3 marks)</p> <p>b. did the test cover all the material it was supposed to (2 marks)</p>
<u>CONCLUSION</u>	<u>CONCLUSION</u>
<p>Did the Instructor:</p> <p>a. summarize effectively?</p>	<p>a. review all MTPs (3 marks), link to a future lesson (1 mark), re-state the reason/why (1 mark)</p>

ADDITIONAL NOTES:

- 30 minute cut off limit
- copy of lesson plan to the instructor before class starts
- make effective use of ICEPAC (interest, comprehension, emphasis, participation, accomplishment, confirmation)
- make effective use of CREST (comparisons, reasons, examples, statistics, testimony)

TRAINING AIDS

LECTURE TYPE	<u>POOR</u>	GOOD	<u>EXCELLENT</u>	EXAMPLES
<ul style="list-style-type: none"> ▪ Fundamental Training 	<ul style="list-style-type: none"> ▪ Blackboard drawings or a few pictures 	<ul style="list-style-type: none"> ▪ Pictures and OHP's 	<ul style="list-style-type: none"> ▪ Always using actual aids that people can touch 	<ul style="list-style-type: none"> ▪ Using real badges, medals, uniforms
<ul style="list-style-type: none"> ▪ Bushcraft ▪ Map and Compass 	<ul style="list-style-type: none"> ▪ Nothing ▪ Only one map and compass (instructor has) 	<ul style="list-style-type: none"> ▪ Having resources for students to see and touch 	<ul style="list-style-type: none"> ▪ Having enough resources for each (or most) of the students 	<ul style="list-style-type: none"> ▪ Having stoves, lanterns, maps, compasses, etc.
<ul style="list-style-type: none"> ▪ Marksmanship 	<ul style="list-style-type: none"> ▪ One rifle (for the instructor) 	<ul style="list-style-type: none"> ▪ Rifles for pairs of students to use 	<ul style="list-style-type: none"> ▪ One rifle per student 	<ul style="list-style-type: none"> ▪ Using real Daisy Air Rifles
<ul style="list-style-type: none"> ▪ Instructional Technique ▪ Public Speaking ▪ Leadership ▪ Citizenship 	<ul style="list-style-type: none"> ▪ Nothing or very little resources (all used only by the instructor) 	<ul style="list-style-type: none"> ▪ Making use of corps' training posters, OHPs, etc. 	<ul style="list-style-type: none"> ▪ Making your own training aids to supplement those at the corps 	<ul style="list-style-type: none"> ▪ Games, Leadership demos, videos, bring items that signify history
<ul style="list-style-type: none"> ▪ Physical Fitness 	<ul style="list-style-type: none"> ▪ Equipment or resources for instructor only 	<ul style="list-style-type: none"> ▪ Having some pictures of equipment for students to touch 	<ul style="list-style-type: none"> ▪ Having enough equipment for each person to use 	<ul style="list-style-type: none"> ▪ Bring in healthy food choices, demo the fitness test

CLASSROOM SET UP

LECTURE TYPE	<u>POOR</u>	GOOD	<u>EXCELLENT</u>	EXAMPLES
<ul style="list-style-type: none"> ▪ F.T. ▪ I.T. ▪ P.S. ▪ Leadership ▪ Citizenship 	<ul style="list-style-type: none"> ▪ Nothing written on the board ▪ Not enough tables and chairs for all students ▪ Training aids not laid out 	<ul style="list-style-type: none"> ▪ Relevant information on the board ▪ Each student has a seat and a place to work ▪ Training aids prepared 	<ul style="list-style-type: none"> ▪ Follow standard board setup ▪ Lots of space for students to work ▪ Training aids laid out in the order that they will be used, and are functional 	<ul style="list-style-type: none"> ▪ Having all the classroom set up complete before the students enter the room ▪ Making sure there is enough space for the students, and type of lecture
<ul style="list-style-type: none"> ▪ Physical Fitness 	<ul style="list-style-type: none"> ▪ Set up in a classroom behind desks or tables ▪ No extra space 	<ul style="list-style-type: none"> ▪ Set up in a drill hall or other available space ▪ Area with resources to teach with ▪ Able to move around 	<ul style="list-style-type: none"> ▪ Set up in gym or other recreational facility available ▪ Have space to do appropriate demonstrations when needed 	<ul style="list-style-type: none"> ▪ Uses the space (classroom) available to its full advantage
<ul style="list-style-type: none"> ▪ Bushcraft ▪ Map and Compass ▪ Marksmanship 	<ul style="list-style-type: none"> ▪ Set up in a classroom behind desks or tables ▪ No extra space 	<ul style="list-style-type: none"> ▪ Room to do appropriate demonstrations, move tables and chairs away and be able to perform activities 	<ul style="list-style-type: none"> ▪ Set up in an outside area such as a field or range ▪ Makes excellent use of classroom space when other space is not available (not sitting behind tables). 	<ul style="list-style-type: none"> ▪ Make sure any equipment/training aids are available and working prior to class ▪ Classroom or other area is neat and tidy

INSTRUCTOR

LECTURE TYPE	<u>POOR</u>	GOOD	<u>EXCELLENT</u>	EXAMPLES
ALL LESSON TYPES	<ul style="list-style-type: none"> ▪ Not dressed appropriately ▪ Does not have good deportment ▪ Does not have good self discipline ▪ Not prepared for the lecture ▪ Not on time 	<ul style="list-style-type: none"> ▪ Dressed appropriately ▪ Has good deportment ▪ Has a good sense of self discipline ▪ Prepared to teach the lecture ▪ On time 	<ul style="list-style-type: none"> ▪ Has impeccable standards of dress ▪ A high standard of deportment ▪ Has exceptional self discipline, sets a good example ▪ Very well rehearsed in the lecture material ▪ Early for lecture 	<ul style="list-style-type: none"> ▪ Wearing the right type of dress for that lecture ▪ Carries themselves with confidence and poise ▪ Responds to situations fittingly ▪ Has practiced the material a few times before teaching It ▪ Be at least 10 min early in order to prepare

LESSON PLAN

LECTURE TYPE	<u>POOR</u>	GOOD	<u>EXCELLENT</u>	EXAMPLES
<ul style="list-style-type: none"> ▪ Fundamental Training ▪ Bushcraft ▪ Map and Compass ▪ Marksman ▪ Instructional Technique ▪ Public Speaking ▪ Leadership ▪ Citizenship ▪ Physical Fitness 	<ul style="list-style-type: none"> ▪ Has no lesson plan or, does not follow proper lesson plan format ▪ No relevant information listed at the beginning ▪ No time breakdown ▪ No into, body, conclusion ▪ Body not broken down into stages ▪ Does not list the what and why ▪ Has no training aids listed ▪ Does not have enough info listed ▪ Has no PO check ▪ Has no re-motivator in conclusion ▪ Is not neat and legible 	<ul style="list-style-type: none"> ▪ Follows proper lesson plan format ▪ Lists some relevant info at beginning ▪ 	<ul style="list-style-type: none"> ▪ Lists the star level PO/ EO, references, supplementary references, trg aids, students aids, method and time before body ▪ Time breakdown of every component ▪ Notes in margins of reminders to self ▪ Writes out the review ▪ Has an intro with the what and why ▪ Body broken down into stages ▪ Each stage with into, body, confirmation ▪ Include PO check at the end ▪ Conclusion with summary and re-motivator ▪ All trg aids/handouts attached ▪ Is neat and legible 	<ul style="list-style-type: none"> ▪ Green star, fundamental training, 402.03, green star CTP, OHP, pencil and notebook, lesson, 1x30min ▪ Review – 3 min ▪ Intro – 2 min ▪ Use OHP 1 here ▪ During this period you will learn...It is important to learn this because... ▪ Stage one Jr Ranks, stage two Sr. Ranks ▪ Written PO to hand in for marks ▪ Summary, in this lesson you learned... ▪ Comment on student progress, next lesson will be... ▪ Remember to take questions from class, and pose them to class

SAMPLE OF A GOOD LESSON PLAN**GREEN STAR COURSE****PO: FUNDAMENTAL TRAINING**

ENABLING OBJECTIVE(S): 402.03: The Rank Structure and Qualifications of the Royal Canadian Army Cadets

REFERENCE(S): A. CCP-118/PH-001 Green Star Course Training Plan; Chapter 4, Page 47/48.
B. CCP-118/PT-001 Green Star Handbook; Chapter 2, Arts 11-12.

SUPPLEMENTARY REFERENCE(S): RCIS(A) Traditions of the Canadian Army PIP; Chapter 5, Art 2.

TRG AID(S): A. OHP
B. OHP Slides
C. Sample rank badges, qualification badges and slip-on ranks
D. RCAC Badge Poster, Graphic Design DPGS 7-2

STUDENT AID(S): A. Green Star Handbook
B. Pencil and notebook

METHOD: Lesson

TIME: 1 X 30 MINs

REVIEW**TIME: 3 MINs**

- I. EO 402.02: **THE AFFILIATED UNIT**
1. What is the name of the Corps' Affiliated Unit?
 2. When was your cadet corps founded?
 3. Name some significant events in the history of the corps.

INTRODUCTION**TIME: 2 MINs**

WHAT: During this period you will learn the Rank Structure and Qualifications of the Royal Canadian Army Cadets.

WHY: It is important for a cadet to be able to identify the different ranks in the Army Cadets in order to pay the proper respect.

WHERE: You will apply this knowledge in your day-to-day interaction with different ranks of the organization and must learn this in order to understand lessons to follow.

BODY		INSTR NOTES
II	<p>STAGE 1: <u>ARMY CADET RANK BADGES</u></p> <p>1. <u>General:</u> In the Army Cadet program, you can advance in rank. As a first year cadet, it is important that you be able to recognize the rank of other Army Cadets.</p> <p>2. <u>Junior Ranks:</u> Are referred to as Junior Non-Commissioned Officers (NCO's). They include:</p> <ul style="list-style-type: none"> a. Private; b. Corporal; and, c. Master Corporal. <p>3. <u>Senior Ranks:</u> Are referred to as Senior NCO's. They include:</p> <ul style="list-style-type: none"> a. Sergeant; b. Warrant Officer; c. Master Warrant Officer; and, d. Chief Warrant Officer. 	<p>TIME: 10 MINs</p> <p>OHP - 1</p> <p>Note: There are variations in these names between branches of the Army. See Annex "A" for details.</p> <p>OHP - 2</p> <p>Note: Cadets will note that the rank structure of the RCAC is the same as the Regular or Reserve Army.</p>
III	<p><u>CONFIRMATION STAGE 1</u></p> <p>1. There are two types of Army Cadet ranks. What are they?</p> <p>2. Name the four Senior Ranks. Name the three Junior Ranks.</p> <p>3. What is the highest rank an Army Cadet can be?</p>	<p>Hand out badges and have cadets stand up in order of the rank badge they have.</p>
IV	<p>STAGE 2: <u>ARMY CADET QUALIFICATION BADGES</u></p> <p>1. <u>General:</u> In the Army Cadet program, you can advance in qualification. As a first year cadet, it is important that you be able to recognize the qualification of other Army Cadets.</p> <p>2. <u>Course Qualification Badges:</u></p> <ul style="list-style-type: none"> a. These badges are awarded to cadets upon the successful completion of summer and advanced training courses. 	<p>TIME: 10 MINs</p> <p>OHP - 3</p> <p>Refer to RCAC Badge Poster, Graphic Design DPGS 7-2 for an</p>

<p>b. Each course has its own badge</p> <p>3. <u>Proficiency Badges:</u></p> <p>a. These badges indicate which star level an individual has completed.</p> <p>b. There is a badge for each star level.</p> <p>4. <u>Instructor Proficiency Badge:</u></p> <p>a. Badge is a Gold Star with a wreath around it.</p> <p>b. Indicates that the individual has passed the National Star Certification Exam (NSCE) and is a qualified instructor.</p> <p>V <u>CONFIRMATION STAGE 2</u></p> <p>1. What is a Course Qualification Badge and what is it awarded for?</p> <p>2. What is a Proficiency Badge and what is it awarded for?</p> <p>3. What is the <i>Instructor</i> Proficiency Badge?</p>	<p>example of each badge.</p> <p>OHP - 4</p> <p>OHP - 5</p>
<p>PERFORMANCE CHECK TIME: 3 MINs</p>	

- I. Each cadet will visually identify all of the ranks of the Royal Canadian Army Cadets.
 - 1. Name and describe one of the junior NCO rank badges.
 - 2. Name and describe one of the senior NCO rank badges.
 - 3. What is the highest rank that an Army Cadet can attain?

- II. Each cadet will visually identify the different qualification badges of the Royal Canadian Army Cadets.
 - 1. What are Army Cadet qualification badges awarded for?
 - 2. What is a proficiency badge?
 - 3. What is an Instructor Proficiency Badge?

CONCLUSION**TIME: 2 MINs**

SUMMARY: In this lesson you have learned The Rank Structure and Qualifications of the Royal Canadian Army Cadets.

- RE-MOTIVATE:**
- A. Comment on student progress.
 - B. You will apply this knowledge in your day to day interaction with different ranks of the organization.
 - C. The next lesson in Fundamental Training will be the Officer Rank Structure and the Chain of Command.

Annex A to

EO 402.03

The Rank Structure and Qualifications of the Royal Canadian Army Cadets

Variation in Non Commissioned Officer Rank Names

In the Army, rank titles vary between regiments and branches. For example, a private in the infantry might be known as a gunner in the artillery, a trooper in an armored unit, a sapper in a field engineer unit, a fusilier in a fusilier regiment, a grenadier in a grenadier regiment and a rifleman in a rifle regiment. A Corporal in the infantry is a bombardier in the artillery.




You should consult with senior members of your corps for the correct terminology if you use any of these alternate names

Below are some equivalents for junior ranks:


Name	Infantry	Armored	Artillery	Engineers
Private	Private	Trooper	Gunner	Sapper
Corporal	Corporal	Corporal	Bombardier	Corporal
Master Corporal	Master Corporal	Master Corporal	Master Bombardier	Master Corporal

Sample Handouts/ OHPs to Attach to Lesson Plan

Badges
Junior Ranks

 Private
 Corporal
 Master Corporal

PO 402.03 Green Star




The overhead slides here come from the Master Lesson Plans. There are many excellent OHPs prepared. Whether you are teaching a lesson at your corps or at NSCE, check to see if there are some you can use. Go to www.

Badges
Senior Ranks

 Sergeant
 Warrant Officer
 Master Warrant Officer
 Chief Warrant Officer

PO 402.03 Green Star



Never limit yourself to overhead slides. Whenever possible use other training aids in addition to overheads. In this lesson you should also have real rank badges the cadets can handle.

CHECKLIST – Lesson Plan

- ❑ I have a *completed* lesson plan that is neat, and legible to instructor and assessor
- ❑ Lesson plan includes an introduction, body, end of lesson test, conclusion
- ❑ Before the intro there is a beginning section that will include information such as: star level, the performance objective, the enabling objective, references and supplementary references, training aids, students aids, method, time allotment
- ❑ Introduction takes up about 10% of the lesson time
- ❑ Introduction includes: who, what, where, how, review
- ❑ Body takes up about 75% of the lesson time
- ❑ Body is broken down into stages, each including an introduction, includes lots of review or practice, has confirmation at the end
- ❑ End of lesson test takes up about 10% of lesson time
- ❑ End of lesson test includes a written test and/or an observation of skill
- ❑ Conclusion takes up about 5% of the lesson time
- ❑ Conclusion includes a summary, closing statement, re-motivating statement
- ❑ Re-motivator includes a comment on student progress, how they will apply the knowledge and what the next lesson will be
- ❑ Included a copy of the PO Check, and any other handouts etc.
- ❑ There is a time breakdown of every section
- ❑ Notes in the margin for myself, including when to use what training aids, additional notes or explanations needed

CHECKLIST – Verbal Support

- ❑ I have gone through, and included all the parts of CREST
- ❑ COMPARISONS, meaningful and relevant
- ❑ REASONS, explanations of why
- ❑ EXAMPLES, clear and relevant to cadets
- ❑ STATISTICS, factual information
- ❑ TESTIMONY, true stories used to clarify

Activity 2

There will not be a written quiz for this section of the unit. Instead, the training officer will assign you a lesson to prepare and teach. Make sure to do the following:

1. Review the information in the reference book and included in the package.
2. Review how to get a great mark on your lesson.
3. Review the pre-made lesson plan.
4. Prepare your lesson plan.
5. Prepare you training aids.
6. Prepare yourself to teach your lesson.
7. Teach your lesson and have it assessed by the training officer or other corps staff member.
8. Review your lesson/mark with the assessor.

UNIT 13 ASSIGNMENT

Part One

Two weeks (minimum) before the national star exam takes place, you will receive your assigned lesson for the actual exam. The first part of your final assignment is to prepare your lesson plan, and all your training aids. Be sure to follow all the hints and pointers that have been given to you in this study manual. Ask your training officer if you need more assistance

Part Two

One week before writing the national exam, you are to teach the assigned lecture to a group of cadets, and be assessed on it. Teach the lesson as if it actually was the exam and you were being marked on it. Sit down with the assessor after and discuss your strengths and weaknesses. If you receive your lesson assignment early enough, teach the lesson again a second time, correcting as many mistakes as possible from the first time.

UNIT 14

Instructional Techniques – Drill Instruction

1. This unit should take you 4 hours to complete. The instructional technique portion of the exam is practical and consists of two tests; the first one being the classroom lesson. Start by reviewing the reading material in the reference book, and then move on to the activities and exercises. You must complete all sections of this unit to be fully prepared for the IT test..

2. Reading:
 - a. Army Cadet Reference Book, Pages 1-5 to 1-58

3. Activities and Exercises:
 - a. Complete Unit 14 - Activity 1, then check your answers
 - b. Complete Unit 14 – Activity 2. If you get 70% or higher on your lesson, move on and complete the unit 14 assignment. If you do not, ask your Trg O to assign another lesson and complete Activity 1 and 2 again.

4. Unit 14 Assignment: This final assignment for this unit will take place in two parts. Both of which can not be finished until about 2 weeks before the national exam takes place, as that is when you will receive the actual drill mutual you will be teaching at the NSCE exam. The first part of the assignment will be to actually prepare for this lesson, and the second part will be to actually teach it before you arrive at the test. Part one will include your any preparation you need to do for the mutual. Once the training officer feels you are prepared, you will teach the lesson and be assessed on it as well. If there is time, teach it again a second time before arriving at NSCE, or at least practice it again at home.



You must achieve a minimum of 60% on the drill lesson to pass.

Activity A

This activity will require you to watch the video titled The Drill Lecture. You will need to get this video from your corps training officer. You will need to either, sign the video out and take it home to watch it, or, you will have to make arrangements with your training officer to watch it on a cadet night.

The instructions for this activity are as follows:

1. Watch the video once through, taking note of both the positive and negative points of lecture (including proper format, instructors voice etc.)
2. Watch the video a second time, this time using the page provided, list what you think the strong, and the weak points are as you go along
3. If possible, compare and discuss the answers with a fellow gold star candidate
4. Check and correct your answers

THE DRILL LECTURE

STRENGTHS	WEAKNESSES

DRILL MONITORING GUIDE

Name: _____ Date: _____ Cadet Corps: _____

Lesson to be Taught: _____ Evaluator: _____

<u>INTRODUCTION</u>	SUB-TOTALS	TOTALS
Did the Instructor: a. conduct a revision? b. use the correct squad formation? c. state the aim (What)? d. state the reason (Why)? e. state requirement for performance (Where)?	 	
		/10
<u>BODY</u>		
Did the Instructor: a. give a complete demo of the movement calling the time? b. give a demo of the first part of the movement by numbers, if applicable? c. explain the first part of the movement? d. permit the squad to ask questions? e. practice the first part of the movement – collectively – individually – collectively? f. teach and practice the second part and each subsequent part of the movement following the same sequence as for the first?	 	
		/45
<u>CONFIRMATION</u>		
Did the Instructor: a. practice complete movement, with instructor calling the time? b. practice the complete movement, with squad calling the time? c. practice the complete movement with squad judging the time?	 	
		/15

<u>CONCLUSION</u>	<u>SUB-TOTALS</u>	<u>TOTALS</u>
Did the Instructor:		
a. restate movement taught and reason?	/3	
b. confirm performance objectives by practice?	/5	
c. mention the next lesson?	/2	
		/10
<u>PERFORMANCE OF INSTRUCTOR</u>		
Did the Instructor:		
a. set the example in dress and deportment?	/4	
b. display a group attitude towards the cadets?	/3	
c. use a vocabulary that was clear and precise?	/3	
d. use the cautionary and executive word of command?	/4	
e. check and correct faults when they occurred?	/2	
f. have a good knowledge of the subject?	/4	
		/20
	<u>TOTAL</u>	<u>/100</u>
EVALUATOR'S COMMENTS: (List the strengths of the lesson and the areas of improvement.)		
<hr/> <div style="text-align: right;"> Evaluator's Signature </div>		

HOW TO GET FULL MARKS ON THE DRILL
LECTURE

<u>INTRODUCTION</u>	<u>INTRODUCTION</u>
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. conduct a revision? b. use the correct squad formation? c. state the aim (What)? d. state the reason (Why)? e. state requirement for performance (Where)? 	<ul style="list-style-type: none"> a. revision must be an applicable lesson b. formation in a single rank or hollow square c. state the aim or the performance statement, what is being taught d. state why it is important to the cadet e. state where it will be applied
<u>BODY</u>	<u>BODY</u>
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. give a complete demo of the movement calling the time? b. give a demo of the first part of the movement by numbers, if applicable? c. explain the first part of the movement? d. permit the squad to ask questions? e. practice the first part of the movement – collectively – individually – collectively? f. teach and practice the second part and each subsequent part of the movement following the same sequence as for the first? 	<ul style="list-style-type: none"> a. must give the complete demo of the movement as per the CF drill manual b. demo of the first movement by numbers, as per the CF drill manual c. clear, concise, sharp explanation of what happens during the movement d. allow time for the class to think about what has been said, leave time for them to ask questions e. give the command to the squad collectively, check them individually and then give the command collectively f. follow as per para b - e
<u>CONFIRMATION</u>	<u>CONFIRMATION</u>
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. practice complete movement, with instructor calling the time? b. practice the complete movement, with squad calling the time? c. practice the complete movement with squad judging the time? 	<ul style="list-style-type: none"> - instructor must combine the movements as per the drill manual and give the demo one more time - must follow the sequence in order - instructor must continue to evaluate and correct faults through out

HOW TO GET FULL MARKS ON THE DRILL LECTURE

<u>CONCLUSION</u>
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. restate movement taught and reason? b. confirm performance objectives by practice? c. mention the next lesson?
<u>PERFORMANCE OF INSTRUCTOR</u>
<p>Did the Instructor:</p> <ul style="list-style-type: none"> a. set the example in dress and deportment? b. display a group attitude towards the cadets? c. use a vocabulary that was clear and precise? d. use the cautionary and executive word of command? e. check and correct faults when they occurred? f. have a good knowledge of the subject?

<u>CONCLUSION</u>
<ul style="list-style-type: none"> a. restate the what, why, and where b. scored as per the confirmation of instructor calling time, class calling the time and class judging the time c. tell class what, where and when the next lesson will be
<u>PERFORMANCE OF INSTRUCTOR</u>
<ul style="list-style-type: none"> a. must have excellent personal drill, dress, and deportment b. must not belittle or degrade any individuals, an equal attitude towards each person in the class c. must use the proper terminology and vocabulary and no profanity d. must use the correct words of command, and observe the proper pauses e. must check and correct through out the lesson until after the confirmation f. must know the drill movement well, as per the CF drill manual

ADDITIONAL NOTES:

- 30 minute cut off time
- must follow sequence of a drill period in order

QUIZ 1

There will not be a written quiz for this section of the unit. Instead, the training officer will assign you a drill lesson to prepare for and teach. (the lesson will be of green or red star) Make sure to do the following:

1. Review the information in the reference book and included in the package.
2. Review how to get a great mark on your lesson.
3. Prepare yourself to teach your lesson.
4. Teach your lesson and have it assessed by the training officer or other corps staff member.
5. Review your lesson/mark with the assessor.

UNIT 14 ASSIGNMENT

Part One

Two weeks (minimum) before the national star exam takes place, you will receive your assigned lesson for the actual exam in the mail. The first part of your final assignment is to prepare yourself for the lesson. Be sure to follow all the hints and pointers that have been given to you in this study manual. Ask your training officer if you need more assistance

Part Two

One week before writing the national exam, you are to teach the assigned lecture to a group of cadets, and be assessed on it. Teach the lesson as if it actually was the exam and you were being marked on it. Sit down with the assessor after and discuss your strengths and weaknesses. If you receive your lesson assignment early enough, teach the lesson again a second time, correcting as many mistakes as possible from the first time.

UNIT 15

Army Cadet Fitness Requirements

1. You should start your NSCE preparation with this unit and revisit it throughout the year. A record sheet is provided for you to be able to calculate your fitness level and track your progress.

2. Reading:
 - a. All of the required reference material is included and is taken from CATO 41-03. (Note: If you compare the material here to the CATO on-line you will notice a few differences. The information in this study guide is the latest and most accurate information. The online CATO will be updated shortly.)

3. Activities and Exercises:
 - a. Complete Unit 15 - Activity 1, complete the ACTF at least 3 times prior to NSCE Phase 2.

4. Unit 15 Assignment: You must pass the Bronze level of the ACFT to pass NSCE. Make sure you are familiar with the requirements and have one of your corps' officers set up and conduct the test for you.



You must achieve a minimum of 'Bronze' on the ACFT to pass the NSCE, however you are given more points for completing Silver or Gold.

ARMY CADET FITNESS TEST (ACFT)

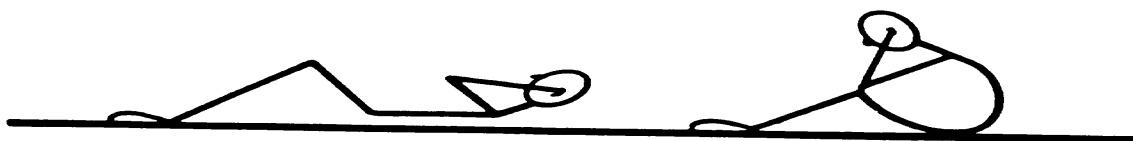
GENERAL

1. There are four exercises in the ACFT, the shuttle run, push-up, sit-ups and the standing long jump. The specific details of each are included in the following pages.
2. To achieve a level, you must accumulate enough points after completing all four exercises. The number of points required for each level is determined by your gender and your age. You only need to calculate the number of points required once. You do not need more points for Silver or Gold; rather the points earned are different for each level. This means you will have to calculate your points total three times, once for Bronze, once for Silver and once for Gold. The points awarded and required follow the description of the exercises.

EXERCISES

SIT UPS

3. The following procedure will be used:
 - a. The cadet lies in a supine position, knees bent at a right angle, and feet about 30 cm apart. The hands are placed beside the head and must be maintained in this position for the duration of the test. Hold the ankles of the cadet and ensure that the heels are in constant contact with the mat. When ready, give the command **begin**. The cadet is required to sit up, by keeping the lower back flat against the ground and "curling" up, and touch the knees with the elbows (count "one") and return to the starting position. The cadet will perform as many repetitions as possible within one minute. Ensure the cadet's shoulder blades return to their initial position each time. The test shall be discontinued as soon as the cadet is seen to strain forcibly to complete a situp.

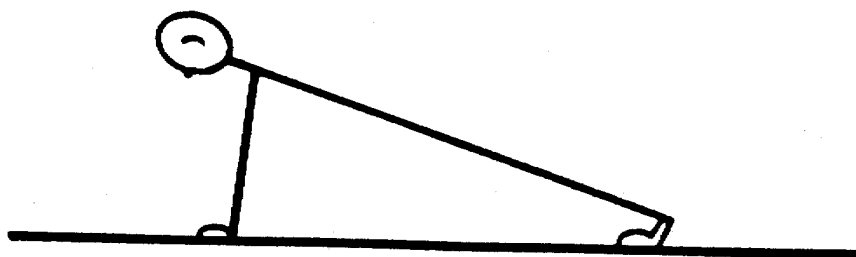
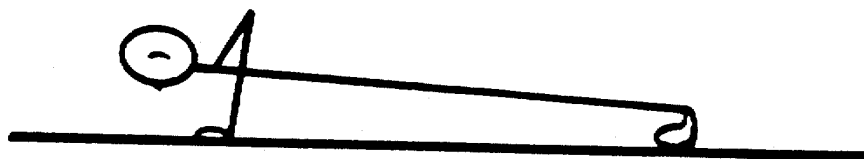


PUSH UPS

4. The following procedure will be used:
- a. The cadet lies flat on stomach, legs together. Hands pointing forward are positioned under the shoulders. The cadet pushes up from the mat by straightening and locking the elbows and using the toes as the pivotal point. The body must be kept in a straight line. The cadet returns to the starting position, upper arms parallel to the mat.
 - b. Push-ups are to be performed continuously and without a time limit. The test shall be discontinued as soon as the cadet is seen to strain forcibly to complete a push-up. Count the initial movement up as "one" and each repetition successfully completed.

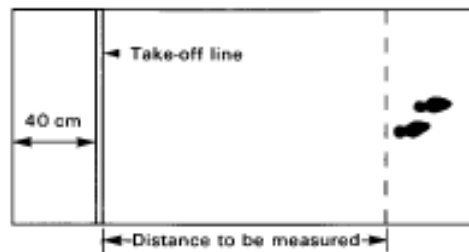
Notes: 1. To assist the cadet in determining the correct lower position, i.e. when the upper arm is parallel to the ground, the tester may place a hand under the cadet's shoulder. Each time the body is lowered, the cadet must touch the tester's hand.

2. Body should be straight, buttocks should not be raised, and abdomen must not sag.



STANDING LONG JUMP

5. The test starts with the cadets standing on a mat with their toes behind the take-off line. Begin with the feet slightly apart. Bend the hips, knees and ankles, push vigorously with the legs while swinging the arms forward.
6. The distance is measured from the start line to the heel of the rear foot in centimeters. Record the better of two attempts.

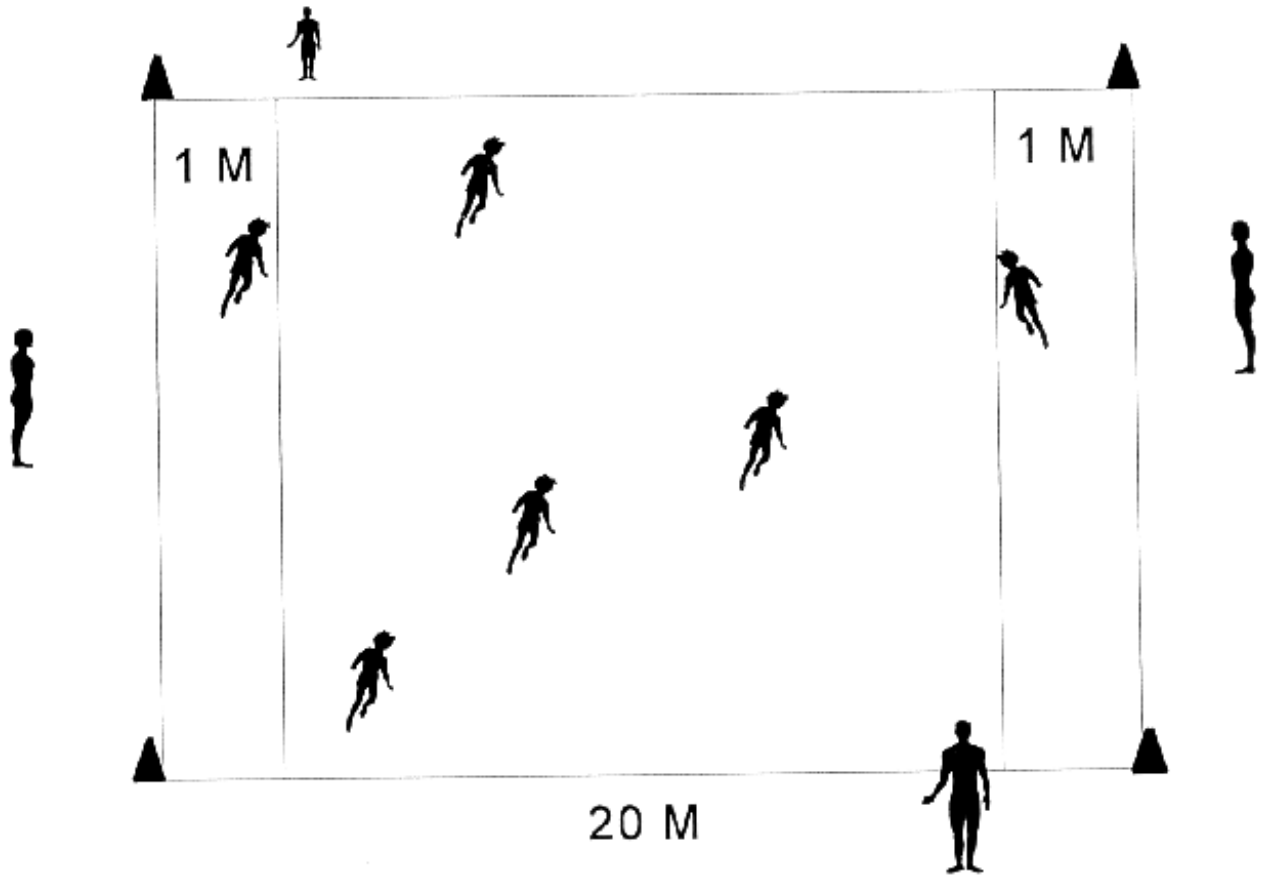


20 METRE SHUTTLE RUN

7. The 20 MSR is a progressive intensity test. It emphasizes safety and gives a very accurate reading of aerobic fitness. It is more dynamic than the run and motivates cadet in achieving a higher level of physical fitness. The test can easily accommodate a larger number of cadets to be tested at the same time in a safe manner.

8. Pylons and or tape are used to mark out the 20-metre course on the gym floor and to indicate the 2 stride (1 metre) zone (Diagram 1). A briefing and demonstration of the evaluation will be given to all cadets prior to the commencement of the evaluation. Several staff will perform the test together, shuttling (running) back and forth across the course in order to demonstrate clearly the procedure to the cadets. A cassette recorder is used to provide the proper cadence. A tone sound will indicate when they should be reaching the line and turning back the other way. The evaluation starts at the walk-jog pace of 8.5 km/hr and increases .5 km/hr for each one-minute stage there after. The maximum length of the test is 20 minutes.

Note: If twice in a row a member cannot reach within 2 strides of the line (standardized by the 1 metre distance indicated by pylons/ tape), have that cadet stop the evaluation immediately and record the last number (stage) announced.



Age group points requirements for Females

Age	Points
12 - 14	20
15 - 16	20
17 - 18	24

Circle the score achieved in each of the exercises and add the points in the total column.

Test	Bronze						Silver						Gold					
	5	6	7	8	9	Pts.	5	6	7	8	9	Pts.	5	6	7	8	9	Pts.
20m Shuttle Run	3	4	5	6	7		5	6	7	8	9		6	7	8	9	10	
Sit Ups	27	28	29	31	32		33	34	35	36	37		39	40	42	43	47	
Push Ups	12	14	15	16	18		21	22	23	25	26		28	31	33	38	46	
Standing Long Jump (cm)	145	150	152	155	157		160	165	173	175	178		178	183	188	193	196	
	Total Bronze Points :						Total Silver Points :						Total Gold Points :					

Age group points requirements for Males

Age	Points
12 - 14	20
15 - 16	24
17 - 18	26

Circle the score achieved in each of the exercises and add the points in the total column.

Test	Bronze						Silver						Gold					
	5	6	7	8	9	Pts.	5	6	7	8	9	Pts.	5	6	7	8	9	Pts.
20m Shuttle Run	4	5	6	7	8		7	8	9	10	11		8	9	10	11	12	
Sit Ups	33	34	35	36	38		39	40	41	42	43		44	46	48	50	53	
Push Ups	18	20	21	22	23		24	26	27	29	31		32	35	39	43	50	
Standing Long Jump (cm)	155	165	178	193	203		170	183	198	208	221		185	198	218	226	239	
	Total Bronze Points :						Total Silver Points :						Total Gold Points :					

ARMY CADET FITNESS TEST RECORD CARD

Name: _____ Age: _____ Gender: _____

TO QUALIFY I NEED:

BRONZE _____ points

SILVER _____ points

GOLD _____ points

	Date: _____				Date: _____				Date: _____			
	SCORE	Points Earned			SCORE	Points Earned			SCORE	Points Earned		
		B	S	G		B	S	G		B	S	G
SHUTTLE RUN												
SIT UPS												
PUSH UPS												
CHIN UPS												
<u>TOTALS:</u>												
	Highest Level Achieved: _____				Highest Level Achieved: _____				Highest Level Achieved: _____			

SECTION D

PREPARING FOR THE EXAM DAY

THE MULTIPLE CHOICE TEST

WHY MULTIPLE CHOICE?

NSCE written exams are all multiple choice or True False questions. This style of exam is used for the following reasons:

when the test group is large

multiple choice exams are more efficient for producing very reliable test scores that can be obtained quickly

multiple choice exams are more suitable for covering the large amount of information that NSCE has to cover

guarantees that the markers remain impartial. The answer is either right or wrong!

POINT VALUE OF QUESTIONS

All questions on the NSCE are not of equal value. If a question deals with material that requires more time and attention then it will be of more value. Make sure you are aware of what each question is worth.

TEST TAKING STRATEGIES

There are three basic ways to approach a multiple-choice test:

1. Start at the first question and keep going, question by question, until you reach the end. Do not leave a question until you have either answered it fully or made an educated guess. This is the quickest way because you do not waste time reading through the whole test trying to decide which question is hardest or easiest.
2. Go through the test and answer every easy question, the ones you know the answers to without thinking really hard. Then go back and do the harder ones. If you are able to complete these quickly then you will have more time to work on the ones that require more thought. This method is recommended by a lot of experts because they say that answering so many questions one after another gives you confidence to handle the questions that you are not sure about. A similar approach is to just note the easier questions as you read through the test. This takes less time but still provides a boost in confidence.
3. Answer the hardest questions first, then go back and do the easy ones. If you are usually most "awake" when you first begin the test it makes sense to go back to the easier ones near the end of the test when you begin to get tired. Also when you answer a hard

question you give yourself a boost in confidence. Also, if time pressure starts to get to you towards the end of the test and panic starts to set in, you are less capable of thinking clearly. Better chance that you will get the easier ones correct at this point than the tougher ones.

ADDITIONAL APPROACHES TO TEST WRITING

1. Read the instructions before you start.
2. Answer the questions that are worth more points first then go back and do the easier ones
3. Always put down an answer for every question
4. Don't allow yourself get into the 'blank stare' phase that sometimes happens when you can't think of the answer. Your time is limited so don't waste it. **DO SOMETHING!** Either guess the answer or mark it as one to come back to. It is more productive to move on even if you get that one question wrong than it is to sit and stare blankly at the paper.
5. Look over the entire test and budget your time for each section
6. The NSCE exam is graded according to the number of correct answers. You do not lose double points for wrong answers, nor are wrong answers subtracted from right ones. Answer every question!
7. Leave time at the end of the test to recheck your answers. There is nothing to be gained by trying to impress every one with how smart you are by being the first to leave the test. Take the time to look over your work. Make sure you have matched up the right answer with the right question. Make sure you did not miss a section. Is your name on the test. Is everything written so it can be easily read? Take the time to make sure you have done the best you can do. Don't worry even if you are the last person to finish. For all you know everyone who left early may have failed even though they looked very confident as they left the room. Take all the time you are given to complete the test- it is your time - use it to your advantage!

READING THE QUESTIONS

1. Don't read too much into questions, some people try to second guess the person who made the test and end up getting too elaborate and losing the answer
2. Underline key words
3. Check for words that are there just to mislead you (Which of the following is *not*...)
4. Read every answer (unless you are in a mad panic as time runs out)

5. When you first read the question, before you look at the answers- decide what you think the answer might be. If your answer is one of the answers listed then your choice is easy.
6. If you don't understand something ask the supervising officer for assistance. Depending on what your problem is, they may or may not be able to help you but its worth trying
7. If you have to read a passage then answer questions on it, read the questions first. This will let you know what you are looking for. If dates are involved circle the dates in the passage as you read.
8. Pace yourself!. If you have 160 questions and are allotted 80 minutes to complete and all questions are of equal value then note that each question gets 30 seconds for completion. Check your watch several times to evaluate your progress

SELECTING THE CORRECT ANSWER

1. Listen to your first thoughts (trust yourself)
2. If two choices are very similar they are probably both wrong.
2. 'All of the above' is often the right answer.
3. If two choices are opposite, one of them is probably the right answer
4. If the answer contains words such as 'all, always, never' or 'none' it is often wrong
5. If the answer contains words such as 'sometimes, probably or some' it is likely to be right.
6. If you cannot find the correct answer start the elimination process by finding the one that is definitely wrong.
7. Don't eliminate answers unless you actually know what every word means>
8. The longest and/or most complicated answer is often the correct one. The person making the test may have had to add information to make the answer complete
9. Create a little code for you to keep track of any questions that you skip or may require a little more thought than you want to give it at that time. If you get partly through a question and decide to finish it later you will need to put a mark in the margin that says 'this question s needs more work and I'll come back to it'.

GUESSING THE ANSWER!

What happens if you have absolutely no idea what the answer is? GUESS!

If there are four possible answers to a multiple-choice exam then you have a 25% chance of being correct if you guess. Sounds like good odds but it means that you also have 75% chance of being incorrect! If you leave the answer blank then it is 100% guaranteed that you will get it wrong. The NSCE does not penalize for incorrect answers other than not getting a point for that question. NEVER leave a question unanswered!

RECHECK YOUR ANSWERS –WHY?

Maybe you did the following:

1. You knew the correct answer but shaded in the (B) instead of the (A).
2. You skipped one question by mistake and all your answers after that one are shaded in the one spot above or below where they should be.
3. You skipped a whole section
4. You misread the question.
5. You made a wild guess to get an answer but by the time you were finished the exam other questions had jogged your memory so now you can make an educated guess instead.

When you go back and recheck your answer should you change the answer of the one you guessed? Provided that your guess was based on something more than just flipping a coin then there is a good chance that it was correct. If your first answer was just a wild guess and you read something in a later question that jogged your memory then by all means change your answer. Perhaps when you read the question again you realize that you misread it the first time. If your choice of answer is still based on total guessing, stick with your first choice!

HOW TO PREPARE

How important is the written testing at NSCE? You have been taking tests at school for years. This is just another test. No doubt, NSCE is a huge part of your cadet life but remember there is life before and after NSCE

The more time you spend dreaming of perfect scores and what comes from that, the greater the degree of pressure you are putting on yourself. The bigger you allow this test to appear in your mind the harder it will be for you to feel confident in your preparations. Remember that positive

thoughts often help bring about positive results. Especially when combined with good, old fashioned thorough preparation!

1. Know what is to be covered on the exam. Confirm with your Training Officer as to exactly which PO/EO's will be covered.
2. Review your resource manual but avoid rereading the entire book. You do not have the time to read it again. Skim over the pages and pull out what you consider as important. Look for such things as words written in a different print and diagrams.
3. Look at any notes you have taken
4. Use flash cards to list some facts
5. Make a time line to help organize all the dates to help you understand when things happened and why they were important
6. It is much easier to remember something if it is different from the ordinary. When you study a concept ask yourself how this new information fits into what you already know. How is this information new and how can you use it.
7. If you are trying to remember a long list of items count them so you can make sure you include them all
8. Repeat what you are trying to learn out loud instead of to yourself
9. Divide the information you are trying to remember into smaller units
10. Cramming does not do the job! Start your preparation early in the training year
11. Some people use memory cues to remember information but others find it easier just to remember the information
12. Make a link between the information you are trying to remember and something already in your memory. Use rhymes, alphabetical order, key words, letters or number cues to increase your memory.

ATTITUDE

Look at completing the test the same way you would look at participating in a sports event. Imagine that you are on the basketball team at your school. You have attended every practice and are in good physical shape. You are up for the challenge of a game against another school. The NSCE is no different. You have prepared yourself mentally at you unit. Look at it in a positive light, as a challenge to yourself. This attitude will keep you in a better frame of mind leading up to the test and while you are writing it.

TAKING CARE OF ANXIETY

It is quite normal to be nervous before an exam. Some people even believe that being nervous is a positive thing because it causes you to be more alert. Unfortunately though it can also stop you from doing your best job.

There are little exercises that you can do before or during the exam that will help you relax and focus on your task.

1. Breathing- inhale slowly through your nose, hold your breathe for a count of two and exhale slowly through your mouth. Repeat this two or three times.
2. Relieve body tension - start with your hands, squeeze them into tight fists then relax, repeat about three times. Repeat with your shoulder area, your abdomen, hips, legs then feet.

Additional things to help alleviate anxiety:

1. Begin your preparation early in the year. Don't leave it to just before the exam.
2. Have your uniform prepared the night before. Then there is no panic rush when getting ready for the exam.
3. Get plenty of sleep the night before the test. Even though you may be meeting old friend that you have not seen since camp do not stay up chatting. Save that for after the test!

AM I PREPARED CHECKLIST

PHASE 1

- Completed sections A, B & D of the study guide
- Prepared my uniform
- Bring a calculator

PHASE 2

- Completed section C of the study guide
- Prepared two classroom lessons plans
- Prepared drill lesson plan
- Prepared all training aids for my lesson
- Completed the ACFT screening questionnaire
- If necessary, completed ACFT medical exemption
- Bring PT gear
- Reviewed kit list
- Have travel documents

ACFT SCREENING QUESTIONNAIRE
QUESTIONNAIRE DE PRÉ-SELECTION POUR LE TPCPA

- | YES
OUI | NO
NON | |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | 1. Has your doctor ever said that you have a heart condition <u>and</u> that you should only participate in physical activities that are recommended by a doctor? |
| | | 1. Votre médecin vous-a-t-il déjà dit que vous souffriez d'un problème cardiaque <u>et</u> que vous ne devriez participer qu'aux activités physiques prescrites et approuvées par un médecin ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 2. Do you feel pain in your chest when you do physical activity? |
| | | 2. Ressentez-vous une douleur à la poitrine lorsque vous faites de l'activité physique ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 3. In the past month, have you had chest pain when you were not doing physical activity? |
| | | 3. Au cours du dernier mois, avez-vous ressenti des douleurs à la poitrine lors des périodes autres que celles où vous participiez à une activité physique ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 4. Do you lose your balance because of dizziness or do you ever lose consciousness? |
| | | 4. Éprouvez-vous des problèmes d'équilibre reliés à un étourdissement ou vous arrive-t-il de perdre connaissance ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 5. Do you have a bone or joint problem that could be made worse by a change in your physical activity? |
| | | 5. Avez-vous des problèmes osseux ou articulaires qui pourraient s'aggraver par une modification de votre niveau de participation à une activité physique ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 6. Is your doctor currently prescribing drugs for your blood pressure or heart condition? (for example, water pills) |
| | | 6. Des médicaments vous sont-ils actuellement prescrits pour contrôler votre tension artérielle ou un problème cardiaque (par exemple, des diurétiques) ? |
| <input type="checkbox"/> | <input type="checkbox"/> | 7. Do you know of <u>any other reason</u> why you should not do physical activity? |
| | | 7. Connaissez-vous <u>une autre raison</u> pour laquelle vous ne devriez pas faire de l'activité physique ? |

If you have answered yes to any of these questions, you should consult a doctor before starting a physical fitness program or trying the Army Cadet Fitness Test

Si vous avez répondu oui à une ou plusieurs questions, vous devriez consulter un médecin avant de poursuivre un programme de conditionnement physique ou essayer le Test de Conditionnement Physique des Cadets de l'Armée

Name/Nom _____

Date _____

Signature _____

Witness/Témoin _____

This questionnaire is a guide to help screen the cadets before testing them on the ACFT.

Ce questionnaire est un guide afin de permettre de vérifier l'aptitude des cadets avant de procéder au TPCPA.

**ARMY CADETS FITNESS TEST
MEDICAL RESTRICTIONS**

Cadet's Name _____ Init _____ Date _____

Corps Number _____

Note: Must be completed by your Doctor

The above named cadet has a medical condition that precludes him/her from attempting the following part(s) of the Army Cadet Fitness Test:

Note: An inability to meet the standard due to obesity that is not the result of a medical problem shall not be recognized as a medical condition for which an exemption is permitted.

1 Push Up

The cadet lies flat stomach, legs together. Hands pointing forward are positioned under the shoulder. the cadet pushes up from the mattress by straightening and locking the elbows and using the toes as pivotal point. The body must be kept in a straight line. The cadet returns to the starting position, upper arms parallel to the mat.

- The cadet has a permanent condition**
- The cadet has a temporary condition until (date) _____**

2 Sit Up

The cadet lies in a supine position; knees bent at a right angle, and feet about 30 cm apart. The hands are placed beside the head and must be maintain in this position for the duration of the test. Ankles of the cadet are held to ensure that heels are in constant contact with the mat.

- The cadet has a permanent condition**
- The cadet has a temporary condition until (date) _____**

3 Standing Long Jump

The test starts with the cadet standing on a mat with their toes behind the starting line. Begin with the feet slightly apart. Bend the hips, knees and ankles, push vigorously with the legs while swinging the arms forward, jumping as far as possible.

- The cadet has a permanent condition**
- The cadet has a temporary condition until (date) _____**

4 20 Meter Shuttle Run

The cadet runs between two markers, 20 meters apart at a progressively faster pace.

- The cadet has a permanent condition**
- The cadet has a temporary condition until (date) _____**

Doctor's comments

Doctor's signature

Doctor's stamp

date

SECTION E

UNIT QUIZ AND
ACTIVITY ANSWER KEY







UNIT 1
Fundamental Training and Citizenship

UNIT 1 – QUIZ 1

1. 5 – Advanced Training or Exchange
4 – Instrument and Level
3 – First Aid
2 – Physical Fitness
1 – Marksmanship
2. A cadet will remove their headdress while eating or required by tradition.
3. a. Develop in youth the attributes of good citizenship and leadership
b. Promote physical fitness
c. Stimulate an interest in the Canadian Forces
4. Cadet Harassment and Abuse Prevention
5. a. Brigadier General
b. Major General
c. Lieutenant General
d. General

6.   
Major Lieutenant Colonel Colonel

7. The cadet will come to attention and salute. When formed up on parade, you will stand at attention.
8. The Major General W.A. Howard medal is awarded for exemplary cadet service and outstanding performance on the NSCE.

9.   
New Brunswick Manitoba Alberta
-   
Northwest Territories Nunavut British Columbia

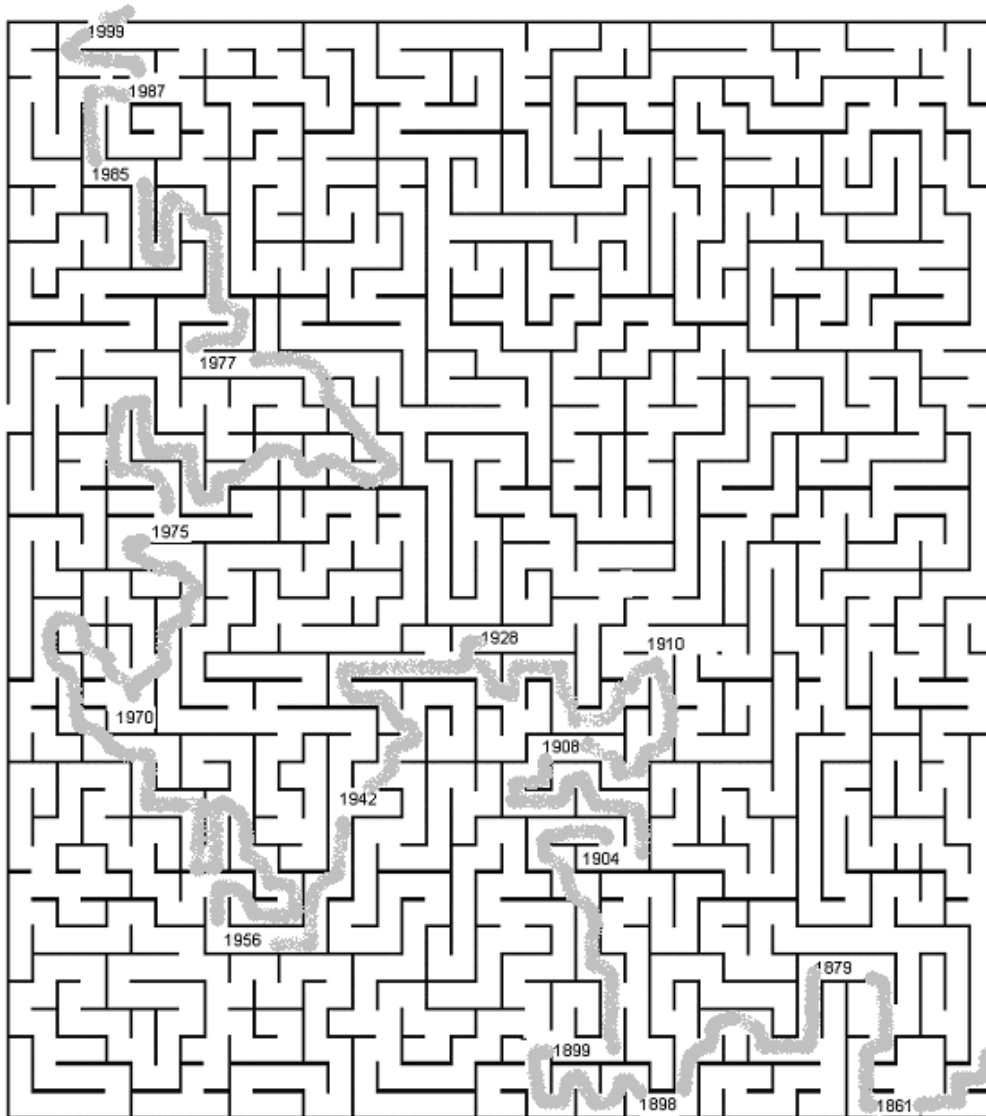
10. Three levels. Companion, Officer, Member

11. The Victoria Cross will be awarded for the most conspicuous bravery, a daring or pre-eminent act of valour, self-sacrifice or extreme devotion to duty, in the presence of the enemy.
12. 1977
13. 15 February 1965
14. Autocracy, Oligarchy, Democracy
15. Federal, Provincial or Territorial, Municipal

UNIT 1 - ACTIVITY A

1. D 2. E 3.F 4. A 5. B 6. C 7. A

ARMY CADET HISTORICAL DATES MAZE(Answer key)



- a. drill associations/ Oldest continually serving corps started-**1861**
- b. Militia General Order 18- **1879**
- c. Term “cadet corps’ first appeared – **1898**
- d. First authorized attachment of cadet corps to militia unit – **1899**
- e. current numbering system to identify cadet corps established – **1904**
- f. cadre of commissioned officers formed – **1908**
- g. Lord Strathcona Trust set up – **1910**
- h. Army Cadet leaders directed to develop patriotism and good leadership in cadets – **1928**
- i. His Majesty King George VI conferred title “royal” to cadets – **1942**
- j. Queen Elizabeth II authorized new design for RCAC crest including motto “Acer Acerpori” – **1956**
- k. Day to day control of cadet was passed to functional commands – **1970**
- l. Females allowed to join – **1975**
- m. New uniform to match post unification Army uniform issued to cadets - **1977**
- n. His Royal Highness Prince Phillip Presented RCAC Banner – **1985**
- o. Enrolment age was returned to 12 – **1987**
- p. Army Cadet program was updated with adventure and challenge as the principle elements of Army Cadet training - **1999**

ANSWER KEY CITIZENSHIP CROSSWORD

		2																
		M																
	2	Q	U	E	E	N	O	F	C	A	N	A	D	3	A			
		N																
1	O	L	I	G	A	R	C	H	Y									
	C		C															
	A		I															
	N		3	P	R	O	V	I	N	C	I	A	L					
	A		A															
	D		4	L	E	G	4	I	S	L	A	T	U	R	E			
	A							N									3	
					5	B	U	R	I	A	L	P	O	L	E	S		U
						K												T
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			5	F			H							7	J			C
			6	E	X	E	U	T	I	V	E				U			R
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				E													B	
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UNIT 2 Bushcraft

UNIT 2 – QUIZ 1

1. The response to question one could be *any three*, of the following five answers.

- a. Ventilating your clothing by opening cuffs, “pit zips” and the front zipper
- b. Wearing clean layers that are loose that don’t retain moisture
- c. Removing your hat when participating in strenuous activities – except when in direct sunlight
- d. Choosing insulation that is appropriate to the temperature and activity, and adding or subtracting layers for changes as they occur
- e. Keeping your socks clean and dry. Always carry extra socks, and change your socks regularly.

2. Your answers should closely resemble these (does not have to be word for word):

- a) Rectangular bag – the most common economical bag. The zipper often opens fully to create a double sized blanket. This style is roomy and can be useful for warm weather camping or indoor accommodation. The disadvantages as a bag for trekking or expeditions are numerous. The extra air space around your torso, legs and feet means that it takes more heat energy to heat up and keep the space warm. The extra material means the bag is bigger and heavier. There is no protection for your head in cold weather, and the liner materials used tend to retain moisture and odors.
- b) Mummy bag – named this because you resemble an ancient Egyptian mummy when you’re in it! The bag tapers from the opening following the contours of your body closely. There is very little extra air space once you are in the bag. The zipper may only reach halfway down the side of the bag and it is protected by an insulated flap (called a “draft tube”). The opening of the bag will have an insulated hood with a draw cord to pull the hood snug around your face to keep warm air in. Mummy bags for extreme cold will come with two separate bags, an inner and outer, that are used together. The mummy bag is certainly the warmest of the bag styles. The amount and type of the insulation will determine the overall bag weight.

3. D

4. C

5. Your answers should closely resemble these (does not have to be word for word):

The *advantages/benefits* of an internal frame pack are:

- a. Comfortable harness that can be adjusted and molded to you
- b. A bag that holds its load close to your back and close to your centre of gravity
- c. Easy to pack bag
- d. The lack of projections and protrusions from pack make trekking in forests and through tight spaces easier

The *disadvantages* of this design are:

- a. Hard to move equipment from one person to another
- b. Hard to carry large or awkward objects
- c. With the back plate pressed against your back, care must be taken while packing to pad sharp or hard objects
- d. Ventilation is restricted across your back

6. Your answers should closely resemble these (does not have to be word for word):

S – **Stop** where you are! Don't panic. Many lost people waste valuable energy, and risk injury by panicking – running aimlessly, continuing to travel after dark, walking in circles etc.

T – **Think** about immediate and future dangers and the factors involved in your situation. Consider the time of day, your physical condition, and the last time you had a drink or something to eat. Try to list the options that are open to you.

O – **Observe** your immediate environment, weather, terrain, resources available, and how each of these effect your options. Look for a location for a shelter, for fresh drinking water, and for clues to your location or the route you took to get to where you are now (e.g. "I followed a stream until it went into a swamp, then I walked over this hill behind me").

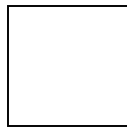
P – **Plan** your best course of action. Include in your plan the methods you will use to signal rescuers.

7. B

8. A

9. These are what you should have drawn.

X



V

Require a Doctor

Need a Map and Compass

Unable to Proceed, Require Help

10. Your answers may include *any three* of the following:

- a. Am I ready?
- b. Is the team ready?
- c. Do I need to practice any skills?
- d. Are there new skills required from me or the team?
- e. Does the team need practice time?
- f. What is the weather forecast?
- g. Do we have food, water, a place to sleep?
- h. Do I understand the emergency plan, the route and the timetable?

UNIT 2 – ACTIVITY A

- | | | | |
|--------------------|------------------------|-----------------------------|-----------------|
| 1. rectangular bag | 2. rectangular bag | 3. air mattress | 4. webbing |
| 5. mummy bag | 6. internal frame pack | 7. external frame back pack | 8. hip belt |
| 9. STOP | 10. survival kit | 11. A frame | 12. poison ivy |
| 13. insects | 14. hypothermia | 15. wind chill | 16. heat stroke |
| 17. water | 18. heat | 19. pain | 20. cold |
| 21. thirst | 22. hunger | 23. fatigue | 24. loneliness |
25. boredom
26. a) Single File
 b) Extended Line
 c) Turn Around
 d) Double Time
 e) Join Me
 f) Halt

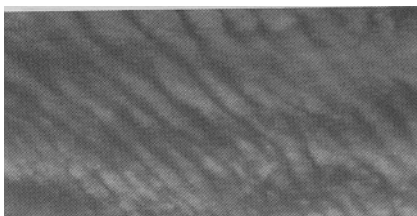
27. Your answers should be identical to the pictures below.



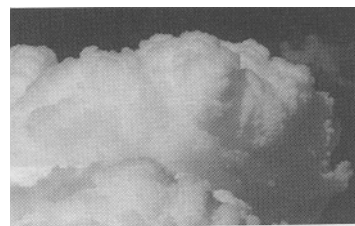
e. Altocumulus



c. Fair Weather Cumulus



b. Cirrocumulus



d. Cumulus Congestus

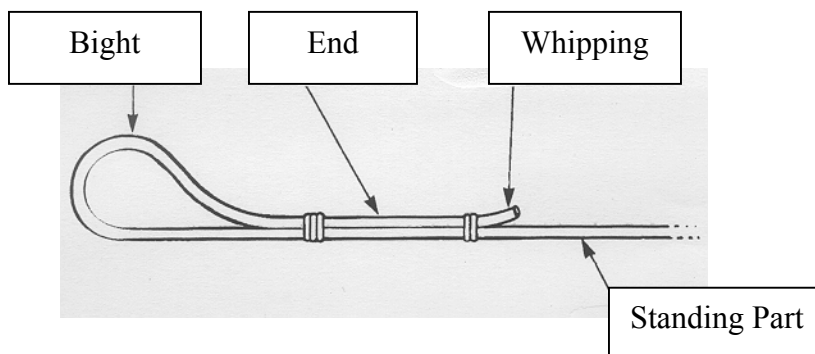


a. Cumulus

28. Your answers should look identical to the chart below.

A Alpha	B Bravo	C Charlie	D Delta	E Echo	F Foxtrot
G Golf	H Hotel	I India	J Juliet	K Kilo	L Lima
M Mike	N November	O Oscar	P Papa	Q Quebec	R Romeo
S Sierra	T Tango	U Uniform	V Victor	W Whisky	X X-ray
Y Yankee	Z Zulu	1 WUN	2 TOO	3 TREE	4 FO- WER
5 FIFE	6 SIX	7 SEV-EN	8 AIT	9 NIN-ER	0 ZE-RO

29. Your answer should look identical to the diagram below.



UNIT 2 – ACTIVITY B

1. C – Clean clothes breathe and insulate better

O – avoid **O**verheating by ventilating

L – dress in **L**oose **L**ayers

D – stay **D**ry.

2. Your list should include *any three* of the following:

a. whistle (plastic)

b. folding pocket knife with a large (10cm) and small blade

c. personal identification and medical insurance card

d. map and compass

e. matches

f. survival kit

g. lip balm

h. notepad and pencil

i. small flashlight

3. Your answers should be very similar to those listed below.

a) A survival situation is the absence of all, or most, of the equipment and conditions you expect in a routine outdoor experience. Injuries, accidents, severe weather, human error, or quite often, a combination of several factors lead people into survival situations. It is when you are left outside with only the contents of your pockets that you are faced with the real life or death struggle of survival.

b) Survival Priority List

i. **First Aid** – for yourself and others. Treat all injuries to the best of your ability. Any health problems left untreated can severely affect your ability to carry out all the other actions required for survival. Complete first aid also includes observing and analyzing current or future dangers.

ii. **Fire** – is a lifesaver! It will provide an important source of heat, assist in providing safe drinking water, and will be a primary tool for signaling your location to rescuers. Even under wet conditions you can start a fire. Gather what you think is enough firewood, then times that by four, that should be enough. Start collecting wood far from your site, then as you grow weaker, collect from closer in.

iii. **Shelter** – is what is going to keep you alive for any extended period of time. You need your shelter to be waterproof, windproof and as insulated as possible. Select a safe location, protected from the elements, but close to a clearing for your signal, and as close as you can to fresh water.

iv. **Signals** – a clearing is the best place to make a signal, anything can be used to make your signal. Toilet paper, rocks, fire and smoke, a mirror, piles of branches, patterns in the snow, etc. Place objects in the form of a triangle as this is a universal distress signal. Bright fire during the night and smoky fire during the day are your best signals.

v. **Water** – you can only survive for three days without water. Heating the water to drink will increase your body core temperature in poor conditions. Always melt snow before ingesting as it uses more fluid for your mouth to melt snow than a mouthful of snow provides. Remember the rules for safe drinking water – do not make yourself sick by drinking water from a suspicious source.

vi. **Food** – you can go a long time without food if you are conserving your energy and body heat. You can not rely on the availability of large game, or your ability to catch it to provide food. In some locations plants with nutritional value may be sparse. Choose food that will give you more food energy than the energy you will expend trying to get it. In most cases the simplest of food sources is the best. Some of the simple things to eat are:

a. snails (lakeshores, forests and fields – boil them);

b. bugs, ants, grubs, grasshoppers and maggots (under rocks, logs, near fields – wash them before boiling, or roasting); and,

c. plants: in the north, rose hips are good (eat the flesh and get rid of the seeds and bristles), cattails (eat the roots of them).

4. C

5. C

6. a. Lean-to

b. Lopped tree shelter;

c. Natural shelters

d. Ground sheet shelters

e. Snow shelters.

UNIT 3
Marksmanship

UNIT 3 - QUIZ 1

1. Your answers should very closely resemble the following:

- a. In a rifle case – the safety catch is ON, the bolt is forward, the action is not cocked, the safety rod is in the barrel and the pump lever is partially open
- b. On the firing line – the safety catch is ON, the bolt is to the rear and the pump lever is partially open
- c. Not on firing line – the safety catch is ON, the bolt is to the rear, the safety rod is in the barrel and the pump lever is partially open.

2. Action – a single pump pneumatic with a straight pull-bolt

Calibre – .177” (4.5 mm);

Muzzle Velocity – 150.8 metres per second

Safety Catch – manual cross-bolt trigger block with red indicator

3. Your list should include *any five* of the following:

- a. Your body should form a 5-20 degree angle with the line of sight
- b. Your spine should remain straight
- c. Your left leg should be parallel with your spine
- d. Your right foot should turn out and point to the right while your left foot should either be straight or point towards the right
- e. Your right knee should form a 30-45 degree angle with your left leg
- f. Your left elbow should be positioned slightly to the left of the rifle
- g. Your left forearm must form an angle greater than 30 degrees with the ground
- h. Your left hand must rest firmly against the sling swivel, and your fingers should be relaxed and not grip the fore end
- i. Once in position your right hand should slightly grip the small of the butt with constant pressure
- j. Your right thumb should be placed on the stock directly behind the rear sight or around the small of the butt
- k. Your right elbow should rest naturally where it falls, not too close or too far from the rifle
- l. Your shoulders should be straight and form right angles with your spine
- m. The butt plate must be kept firmly in the hollow of the right shoulder
- n. Your head should rest comfortably on the butt and remain straight.

4. D

5. A

6. B

7. B

UNIT 3 – ACTIVITY A

S	I	G	H	T	A	L	I	G	N	M	E	N	T	F	T				
					M	A	S	T	E	R	E	Y	E						
													E				S		
												M					L		
											N						I		
B		M	U	Z	Z	L	E			G				<u>E</u>			N		
R									I				<u>L</u>	E	A	D	G	L	
E			W					L				<u>F</u>		Y				O	
A			A				A	A	I	M	<u>I</u>	N	G	E				R	
T			S			L				<u>R</u>				R				T	
H			H		A				<u>E</u>					E				N	
I				R				<u>H</u>						L				O	
N			U				<u>T</u>							I		G		C	
G		T				<u>G</u>								E		N		R	
	A				<u>N</u>									F		I		E	
N				<u>I</u>													K		G
			<u>D</u>													A		G	
		<u>L</u>	W	I	N	D	A	G	E	K	N	O	B			C		I	
	<u>Q</u>																		R
<u>H</u>		S	A	F	E	T	Y	C	A	T	C	H							T

1. The five principles of marksmanship are: **POSITION, HOLDING THE RIFLE, AIMING, BREATHING, TRIGGER CONTROL**
2. The mechanism that once engaged prevents the rifle from firing by locking the trigger in place is called the **SAFETY CATCH**.
3. Handling pellets can leave a trace of **LEAD** on your hands so it is important to **WASH** them thoroughly after any contact with pellets.
4. The front end of the barrel with attachable barrel weight is called the **MUZZLE**
5. The air rifle used in the cadet marksmanship program is the **DAISY 853C**
6. Everyone has one eye which is stronger than the other, this is called the **MASTER EYE**
7. The distance between your eye and the rear sight is called **EYE RELIEF**.
8. The most critical element of the aiming process is **SIGHT ALIGNMENT** which refers to the alignment of the eye, the rear sight and the front sight.
9. The **SLING** helps to support the weight of the rifle ensuring minimal muscular effort on the part of the shooter.
10. **NATURAL ALIGNMENT** is obtained when the rifle can be perfectly aimed at the target without being muscled into position.
11. The **WINDAGE KNOB** moves the pellet impact on the target sideways on the target.
12. **CAKING** results when residue from the compression chamber air blown into the bore condenses in the barrel.

PARTS OF THE DAISY

Unscramble the following words and then label the parts of the Daisy 853C indicated by the arrows.

- | | |
|-------------------------------|-----------------------------------|
| 13. kcots – STOCK | 14. earr gthis - REAR SIGHT |
| 15. gergirt – TRIGGER | 16. ggertir ruadg – TRIGGER GUARD |
| 17. ntfor tsigh - FRONT SIGHT | 18. tutb telap – BUTT PLATE |
| 19. ltob – BOLT | 20. edef kartc - FEED TRACK |
| 21. lerarb - BARREL | 22. zelzum - MUZZLE |
| 23. refo den - FORE END | 24. ysfeta cchat - SAFETY CATCH |

25. Place the safety catch in the ON position. Open the bolt fully to the rear. RSO will insert a safety rod in the barrel to clear the pellet.

UNIT 4

Public Speaking and Leadership

UNIT 4 – QUIZ 1

1. Personality, Preparation, Presentation.
2. Any five of the following:
 - Personal appearance,
 - Memorize the openings sentence,
 - Breathe deeply,
 - Believe in yourself,
 - Prepare your speech,
 - Pick out a friendly face,
 - Voice
3. T – Together
E – Everyone
A – Accomplishes
M – More
4. Morale is a state of mind. It directly influences the performance and proficiency of individuals and therefore, that of the organization itself.
5. The art of influencing human behaviour in order to accomplish a task in the manner desired by the leader.
6. Authoritative, Participative, Free-Rein
7. The persuasive element is setting an example; the persuasive leader encourages and inspires cadets to participate in the assigned task.
8. Any three of the following:
 - What does the originator mean
 - What is understood by the recipient
 - Barriers to communication
 - The result of communication
 - Feedback
9. General supervision, Close supervision, Direct supervision, Immediate supervision
10. Any five of the following: Supervisory plan
 - Behaviour management
 - Rules and regulations
 - Identifying dangerous situations and conditions
 - Security
 - First aid
 - Emergency plan
11. S – Situation
M – Mission
E – Execution
S – Service Support
C – Command and Signals
12. Deliberate – something you do on purpose so that the cadets can see you

Unconscious – when the cadets notice what the leader does, without the leader knowing they are being observed.

UNIT 4 – ACTIVITY A

1. Select and limit the subject
Determine the purpose
Analyze the audience and occasion
Gather the data and know your material
Outline the material
Organize and develop the speech into the introduction, body and conclusion
Plan visual aids
Practice aloud and rehearse
2. Comply with rules and orders
Make responsible decisions for your own safety
Maintain good personal habits and manners
Admit your mistakes and learn from experience
Cooperate with others and work as a member of a team
Accept constructive criticism
Take care of personal equipment
Encourage your team-mates
3. Esprit de corps is team spirit, and in the simplest terms represents one's pride in belonging to a particular organization or unit.
4. Any five of the following:
 - a. Lead by setting a good example for others to follow
 - b. Get to know the cadets in your charge and look after their welfare
 - c. Develop the leadership potential from among the cadets in your charge
 - d. Make sound and timely decisions
 - e. Train the cadets to work together as a team to complete a task
 - f. Communicate your ideas and thoughts clearly
 - g. Keep the cadets informed of all activities and developments as they happen
 - h. Take personal initiatives
 - i. Learn to recognize your personal strengths and weaknesses
 - j. Treat the cadets as you would like to be treated yourself
5. The science of employing human resources and material in the most economical and effective accomplishment of a task.
6. The lawful authority that a superior exerts over their followers by virtue of their rank or appointment.
7. Situations of danger or emergencies

When you require a high level of productivity from an inexperienced team or Individual

Where the task is important, time is limited, and the team will be placed at risk if they are not successful

Passing on important orders or instructions

Significant feedback from the team is not required

When you are not trying to teach members of the team
8. Persuasive element. Development element.

9. Emotional barriers
Prejudicial barriers
Misinterpretation barriers
Mixed message barriers
Vocabulary barriers
Overload barriers
Noise barriers
10. Immediate supervision is when participants are within your arms length, and it should be used in a dangerous or unsafe situation.
11. Trial and error. Straight analysis. Logical analysis.
12. Voluntary discipline. Imposed discipline.

UNIT 5 Map and Compass

Introduction to map using and Conventional Signs

UNIT 5 – QUIZ 1

- | | | |
|------------|-----------------------|---|
| 1. B and C | 2. Conventional Signs | 3. Universal Transverse Mercator Projection |
| 4. 2.5 KM | 5a. Red | 5b. Brown 5c. Blue |

UNIT 5 – ACTIVITY A

- | | | | | | |
|-------------------|---------------------|-----------|--------------------|-------------------|-------------|
| 1. police station | 2. church | 3. bridge | 4. railway | 5. airfield | 6. river |
| 7. school | 8. quarry | 9. marsh | 10. rapids | 11. foot bridge | 12. hill |
| 13. trail | 14. cemetery | 15. sand | 16. telephone line | 17. gate on road | 18. orchard |
| 19. picnic area | | | | | |
| 20. | 1. topographical | | | 21. topographical | |
| | 2. atlas | | | 22. 1:50,000 | |
| | 3. street maps | | | 23. brown | |
| | 4. road maps | | | 24. 20 meters | |
| | 5. relief maps | | | | |
| | 6. outline maps | | | | |
| | 7. aerial maps | | | | |
| | 8. statistical maps | | | | |
| | 9. digital maps | | | | |

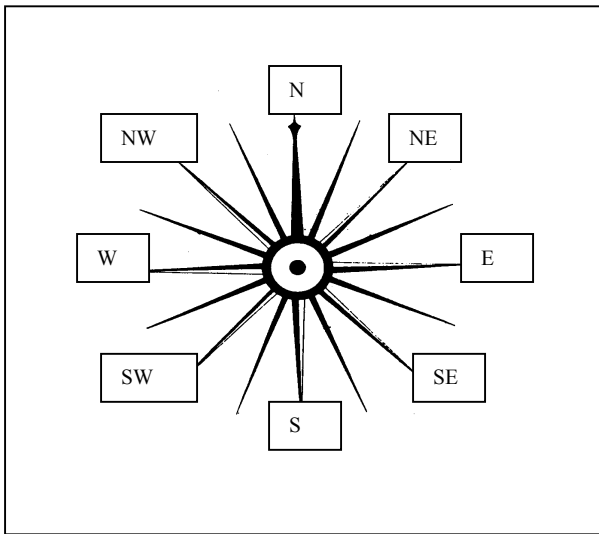
UNIT 6 Map and Compass

Parts of a Compass and Points on a Compass

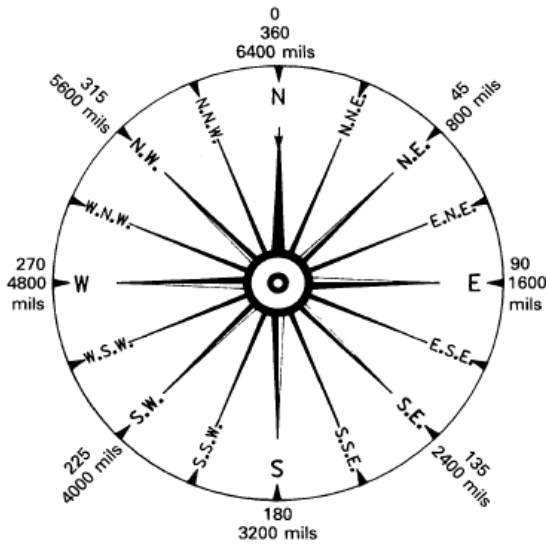
UNIT 6 – QUIZ 1

- | | | | | |
|--------------|---------------|-------|--------------|---------------|
| 1. B | 2. A | 3. B | 4. C | 5. B |
| 6. C | 7. A | 8. B | 9. 1600 mils | 10. 4000 mils |
| 11. 800 mils | 12. 0400 mils | 13. D | 14. B | 15. C |

16.



- | | |
|--|---|
| <p>17. A – sight
 B – compass cover
 C – sighting mirror
 D – sighting line
 E – luminous index point
 F – compass dial
 G – dial graduations
 H – orienting arrow
 I – 1:25 000 romer
 J – compass base plate</p> | <p>K – declination scale
 L – compass meridian lines
 M – magnetic needle
 N – luminous orienting points
 O – luminous index point
 P – 1:50 000 romer
 Q – safety cord (lanyard)
 R – adjustable wrist lock
 S – screwdriver</p> |
|--|---|

UNIT 6 – Quiz 2


10. **True North** – is located at the top of the earth where the lines of longitude converge.

Grid North – is the north indicated by grid lines on a topographical map and since Eastings never converge because they are parallel to each other, grid north will always be slightly off true north.

Magnetic North – is where the compass needle points

UNIT 7

Map and Compass

Conversion of Bearings, Plan and Lead a Nav Ex, and the GPS

UNIT 7 – QUIZ 1

1.

	M		D		G
<i>Step 1 – Complete Table</i>	X		W 180 mils		3000 mils

<i>Step 2 – Add signs (West Dec.)</i>	X	=	W 180 mils	+	3000 mils
---------------------------------------	---	---	------------	---	-----------

Step 3 – Complete math $X = 180 + 3000$
 $X = 3180$ mils

2.

	M		D		G
<i>Step 1 – Complete Table</i>	4400 mils		W 270 mils		X

<i>Step 2 – Add signs (West Dec.)</i>	4400 mils	=	W 270 mils	+	X
---------------------------------------	-----------	---	------------	---	---

Step 3 – Complete math $X = 4400 - 270$
 $X = 4130$ mils

3.

	M		D		G
<i>Step 1 – Complete Table</i>	1800 mils		E 165 mils		X

<i>Step 2 – Add signs (East Dec.)</i>	1800 mils	+	E 165 mils	=	X
---------------------------------------	-----------	---	------------	---	---

Step 3 – Complete math $X = 1800 + 165$
 $X = 1965$ mils

4.

	M		D		G
<i>Step 1 – Complete Table</i>	X		E 280 mils		6200 mils

<i>Step 2 – Add signs (East Dec.)</i>	X	+	E 280 mils	=	6200 mils
---------------------------------------	---	---	------------	---	-----------

Step 3 – Complete math $X = 6200 - 280$
 $X = 5920$ mils

5. 18

6. Safety of participants, skill level of participants, amount of time available, what skills need to be practiced, resources available, type of activity.

7. True 8. False 9. D

10. Ground control, Satellites, Receiver.

UNIT 7 – QUIZ 2

1. 1st Convert degrees to mils (use 18 mils = 1°) \longrightarrow 12° x 18 = 216 mils

<i>Step 1 – Complete Table</i>	M		D		G
	X		W 216 mils		5900 mils

<i>Step 2 – Add signs (West Dec.)</i>	X	=	W 216 mils	+	5900 mils
---------------------------------------	---	---	------------	---	-----------

Step 3 – Complete math $X = 216 + 5900$
 $X = 6116$ mils

2.

<i>Step 1 – Complete Table</i>	M		D		G
	500 mils		W 375 mils		X

<i>Step 2 – Add signs (West Dec.)</i>	500 mils	=	W 375 mils	+	X
---------------------------------------	----------	---	------------	---	---

Step 3 – Complete math $X = 500 - 375$
 $X = 125$ mils

3.

<i>Step 1 – Complete Table</i>	M		D		G
	1645 mils		E 175 mils		X

<i>Step 2 – Add signs (East Dec.)</i>	1645 mils	+	E 175 mils	=	X
---------------------------------------	-----------	---	------------	---	---

Step 3 – Complete math $X = 1645 + 175$
 $X = 1820$ mils

4.

<i>Step 1 – Complete Table</i>	M		D		G
	X		E 200 mils		2800 mils

<i>Step 2 – Add signs (East Dec.)</i>	X	+	E 200 mils	=	2800 mils
---------------------------------------	---	---	------------	---	-----------

Step 3 – Complete math $X = 2800 - 200$
 $X = 2600$ mils

5. C
6. Ionospheric interference, satellite geometry, dense vegetation or rocks
7. Quick reference for your location, confirm map and compass skills, confident navigation in poor weather or confusing terrain.

UNIT 8
Map and Compass
Four/Six Figure Grid References, Measuring Distance, Contour Lines

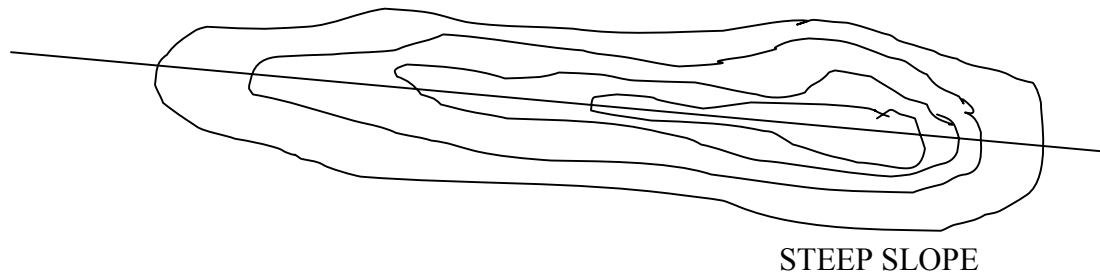
UNIT 8 – QUIZ 1

1. Both 'a' and 'b' are correct

When the contour lines are close together it is a steep slope but when they are far apart it is a gentle slope. Where they are very far apart you really have flat ground.

2. Answer similar to this diagram below is acceptable.

GENTLE SLOPE

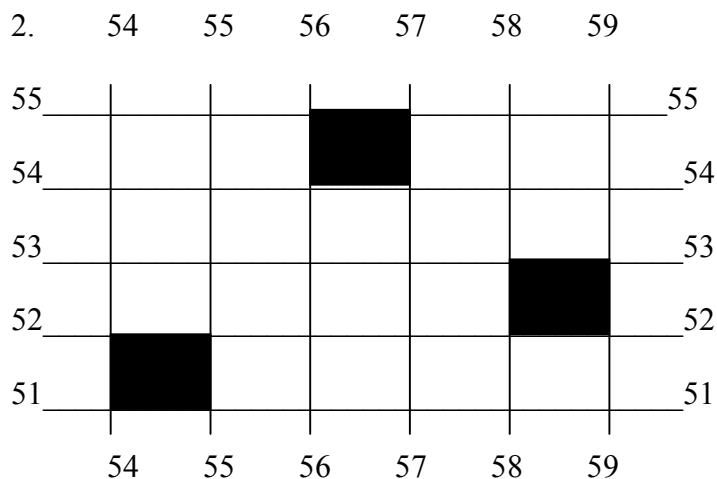


3. the left side
4. D
5. B

6. a. Motel b. School c. Rolley Lake d. Sawmill
7. a. 4.1 km b. 6.8 km
8. a. 8.2 km b. 8.3 km
9. the top bar
10. a. 444546 b. 548488 c. 437456 d. 435459 e. 437457
11. a) Trees, roads, Whonnock Creek, buildings, railway
 b) The highest point is 160 meters.
12. a) GR 509481
 b) 100 m

UNIT 8 – QUIZ 2

1. a) left to right d) bottom to top



3. #1 – 8412 #2 - 8410 #3- 8509 #4-8511 #5-8711 #6-8809

Remember the grid square number is taken from bottom left-hand corner of that square.

4.
 - a.) Rolley Lake
 - b) Iron Mountain
 - c) Seminary
 - d) Silverdale

5.
 - a) hall , school, road

 - b) bridge, road, buildings

 - c) buildings, railway, road

 - d) communications tower, road, buildings

6. GR983242

7.

a) picnic area	b) bridge	c) school	d) building
----------------	-----------	-----------	-------------

8.

a) 11.5 km	b) 6 km
------------	---------

9.

a) 3.3 km	b) 5 km
-----------	---------

10. Contours are lines on a map that follow a certain level throughout their length.

UNIT 9
Map and Compass
Orient a Map Using a Compass and Measure a Magnetic Bearing

UNIT 9 – QUIZ 1

1.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1985 \\ \hline 17 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 17 \\ \times 5' \\ \hline 85' \end{array} = 1^{\circ} 25'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 19^{\circ} 52' \\ - 1^{\circ} 25' \\ \hline 18^{\circ} 27' \end{array} \longrightarrow \mathbf{18^{\circ} 27' W}$$

2.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1999 \\ \hline 3 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 3 \\ \times 10' \\ \hline 30' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 20^{\circ} 42' \\ - 30' \\ \hline 20^{\circ} 12' \end{array} \longrightarrow \mathbf{20^{\circ} 12' W}$$

3.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1996 \\ \hline 6 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 6 \\ \times 5' \\ \hline 30' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 5^{\circ} 59' \\ + 30' \\ \hline 5^{\circ} 89' \end{array} \longrightarrow \mathbf{6^{\circ} 29'}$$

4.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1998 \\ \hline 4 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 4 \\ \times 5' \\ \hline 20' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 6^{\circ} 35' \\ + 20' \\ \hline 6^{\circ} 55' \end{array} \longrightarrow \mathbf{6^{\circ} 55' \text{ W}}$$

5.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1995 \\ \hline 7 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 7 \\ \times 15' \\ \hline 105' \end{array} = 1^{\circ} 45'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 5^{\circ} 55' \\ - 1^{\circ} 45' \\ \hline 4^{\circ} 10' \end{array} \longrightarrow \mathbf{4^{\circ} 10' \text{ E}}$$

6.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1997 \\ \hline 5 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 5 \\ \times 5' \\ \hline 25' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 9^{\circ} 01' \\ + 25' \\ \hline 9^{\circ} 26' \end{array} \longrightarrow \mathbf{9^{\circ} 26' \text{ E}}$$

7.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1990 \\ \hline 12 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 12 \\ \times 5' \\ \hline 60' \end{array} = 1^\circ$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 7^\circ 35' \\ + 1^\circ \\ \hline 8^\circ 35' \end{array} \longrightarrow \mathbf{8^\circ 35' W}$$

8.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1993 \\ \hline 9 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 9 \\ \times 7' \\ \hline 63' \end{array} = 1^\circ 03'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 7^\circ 35' \\ - 1^\circ 03' \\ \hline 6^\circ 32' \end{array} \longrightarrow \mathbf{6^\circ 32' E}$$

9.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1990 \\ \hline 12 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 12 \\ \times 6' \\ \hline 72' \end{array} = 1^\circ 12'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 5^\circ 55' \\ + 1^\circ 12' \\ \hline 6^\circ 67' \end{array} \longrightarrow \mathbf{7^\circ 07' E}$$

10.

Step 1 – subtract the years

$$\begin{array}{r} 2002 \\ - 1980 \\ \hline 22 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 22 \\ \times 10' \\ \hline 220' \end{array} = 3^{\circ} 40'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 1^{\circ} 14' \\ - 3^{\circ} 40' \\ \hline -3^{\circ} 34' \end{array} \longrightarrow \mathbf{3^{\circ} 34' W}$$

UNIT 9 – QUIZ 2

1.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1986 \\ \hline 18 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 18 \\ \times 5' \\ \hline 90' \end{array} = 1^{\circ} 30'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 8^{\circ} 42' \\ + 1^{\circ} 30' \\ \hline 9^{\circ} 72' \end{array} \longrightarrow \mathbf{10^{\circ} 12' E}$$

2.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1997 \\ \hline 7 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 7 \\ \times 5' \\ \hline 35' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 19^{\circ} 39' \\ - 35' \\ \hline 19^{\circ} 04' \end{array} \longrightarrow \mathbf{19^{\circ} 04' W}$$

3.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1995 \\ \hline 9 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 9 \\ \times 10' \\ \hline 90' \end{array} = 1^{\circ} 30'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 21^{\circ} 52' \\ - 1^{\circ} 30' \\ \hline 20^{\circ} 22' \end{array} \longrightarrow \mathbf{20^{\circ} 22' E}$$

4.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1990 \\ \hline 14 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 14 \\ \times 10' \\ \hline 140' \end{array} = 2^{\circ} 20'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 1^{\circ} 30' \\ + 2^{\circ} 20' \\ \hline 3^{\circ} 50' \end{array} \longrightarrow \mathbf{3^{\circ} 50' W}$$

5.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1987 \\ \hline 17 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 17 \\ \times 7' \\ \hline 119' \end{array} = 1^{\circ} 59'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 12^{\circ} 35' \\ + 1^{\circ} 59' \\ \hline 13^{\circ} 94' \end{array} \longrightarrow \mathbf{14^{\circ} 34' W}$$

6.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1999 \\ \hline 5 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 5 \\ \times 7' \\ \hline 35' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 5^{\circ} 55' \\ - 35' \\ \hline 5^{\circ} 20' \end{array} \longrightarrow \mathbf{5^{\circ} 20' W}$$

7.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1997 \\ \hline 7 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 7 \\ \times 15' \\ \hline 105' \end{array} = 1^{\circ} 45'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 18^{\circ} 40' \\ - 1^{\circ} 45' \\ \hline 16^{\circ} 55' \end{array} \longrightarrow \mathbf{16^{\circ} 55' E}$$

8.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1993 \\ \hline 11 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 11 \\ \times 15' \\ \hline 165' \end{array} = 2^{\circ} 45'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 3^{\circ} 45' \\ + 2^{\circ} 45' \\ \hline 5^{\circ} 30' \end{array} \longrightarrow \mathbf{6^{\circ} 30' W}$$

9.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1998 \\ \hline 6 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 6 \\ \times 5' \\ \hline 30' \end{array}$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 3^{\circ} 35' \\ + 30' \\ \hline 3^{\circ} 65' \end{array} \longrightarrow 4^{\circ} 05' \text{ E}$$

10.

Step 1 – subtract the years

$$\begin{array}{r} 2004 \\ - 1981 \\ \hline 15 \end{array}$$

Step 2 – multiply by annual change

$$\begin{array}{r} 15 \\ \times 5' \\ \hline 75' \end{array} = 1^{\circ} 15'$$

Step 3 – add/subtract total change from the angle between grid and mag. north

$$\begin{array}{r} 14^{\circ} 42' \\ - 1^{\circ} 15' \\ \hline 13^{\circ} 27' \end{array} \longrightarrow 13^{\circ} 27' \text{ W}$$

UNIT 10

Measuring a Grid Bearing

UNIT 10 – QUIZ 1

1. 0550 mils 2. 2100 mils 3. 4350 mils 4. 3100 mils 5. 5100 mils

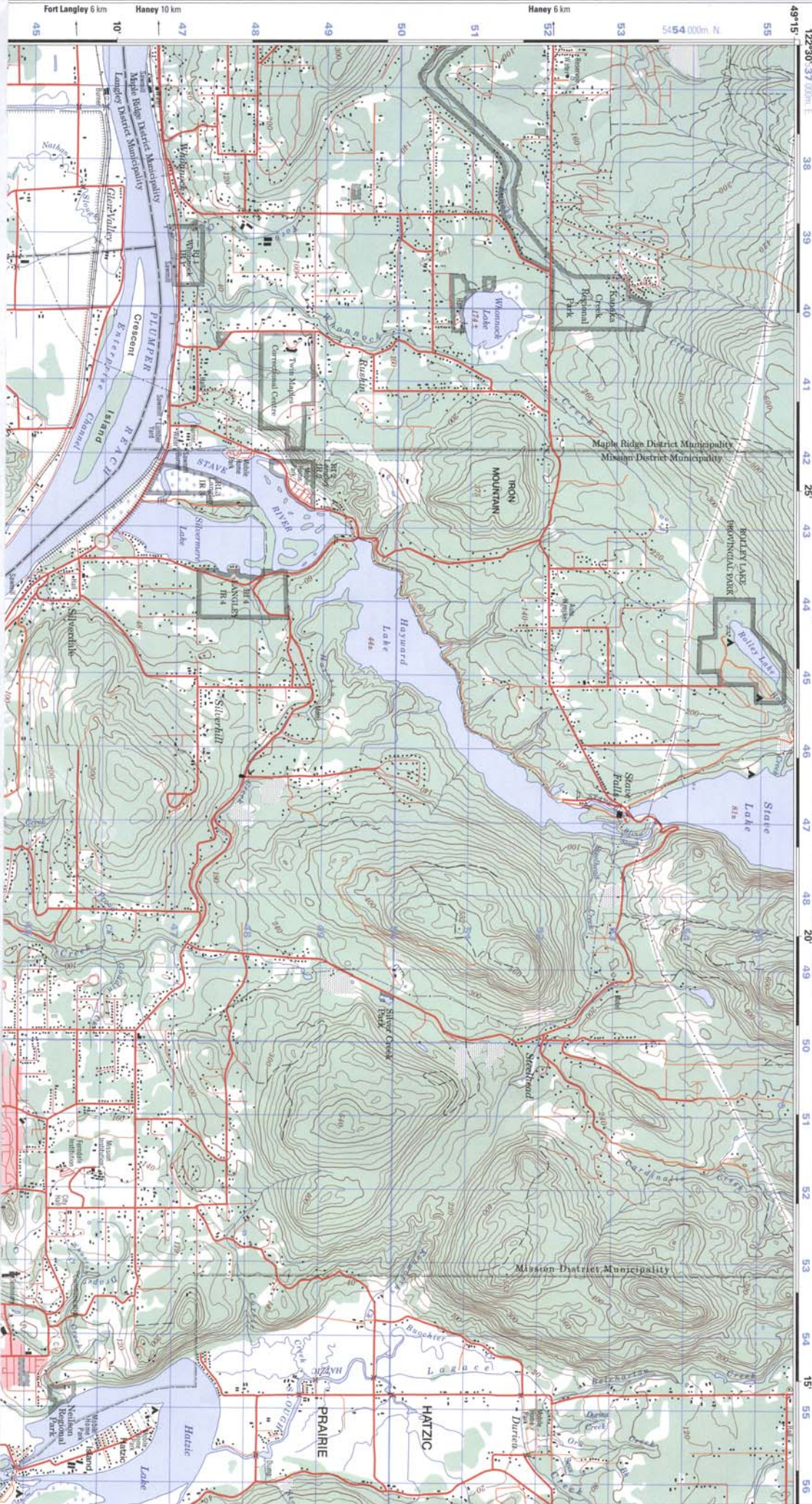
UNIT 10 – QUIZ 2

1. 0625 mils 2. 4850 mils 3. 3200 mils 4. 2175 mils 5. 4250 mils

SECTION F

MAPS

(For use with Unit 8 – Quiz 1 and 2)



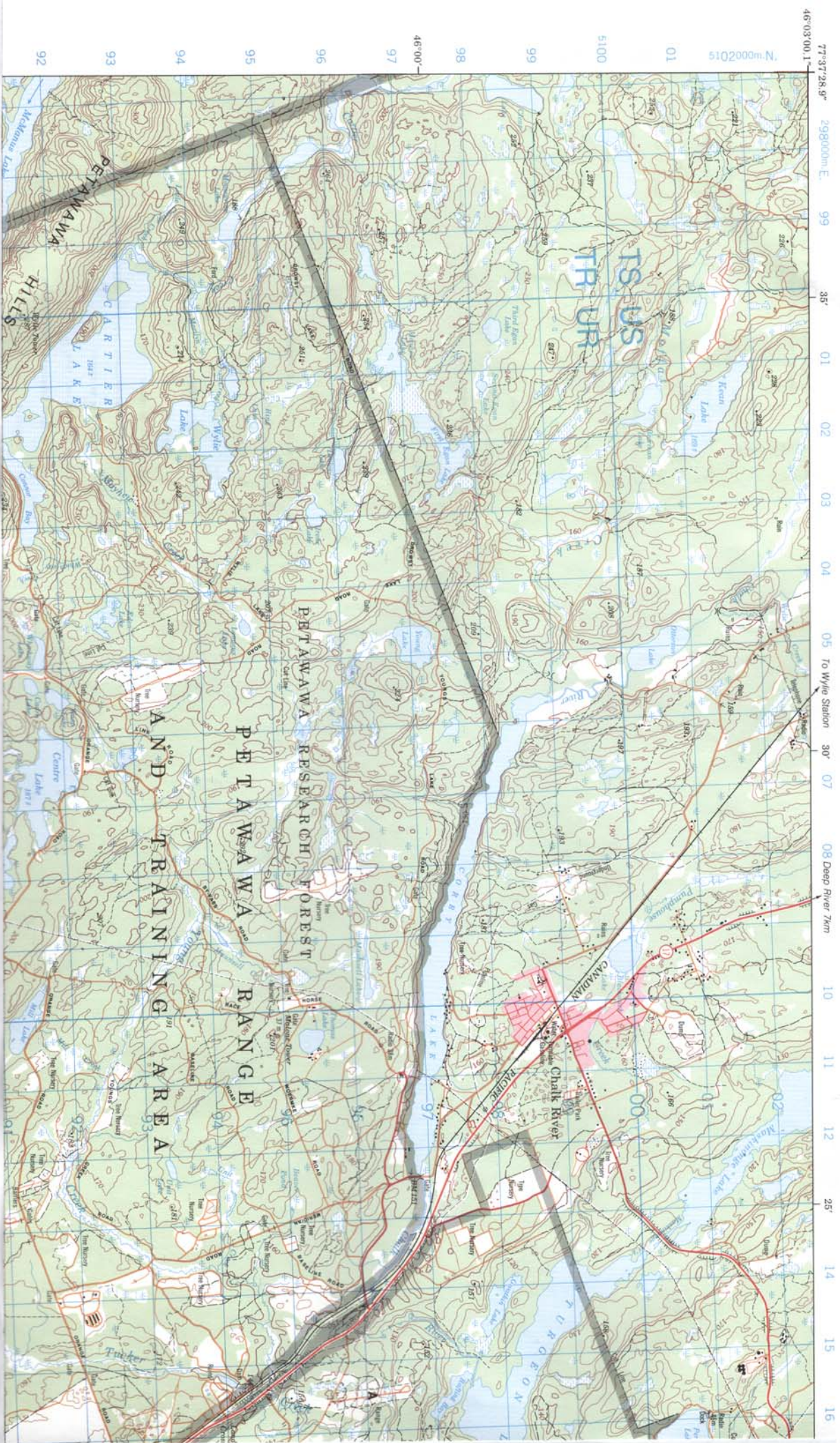
1 centimetre on the map represents 500 metres on the ground
 1 centimètre sur la carte représente 500 mètres au sol
 Contour Interval: 20 Metres
 Equidistance des courbes: 20 mètres
 Elevations in Metres above Mean Sea Level
 Altitudes en mètres au-dessus du niveau moyen de la mer

1/50 000

Kilometres
 0 1 2 3 4 Kilometres

Miles
 0 1 2 3 Miles

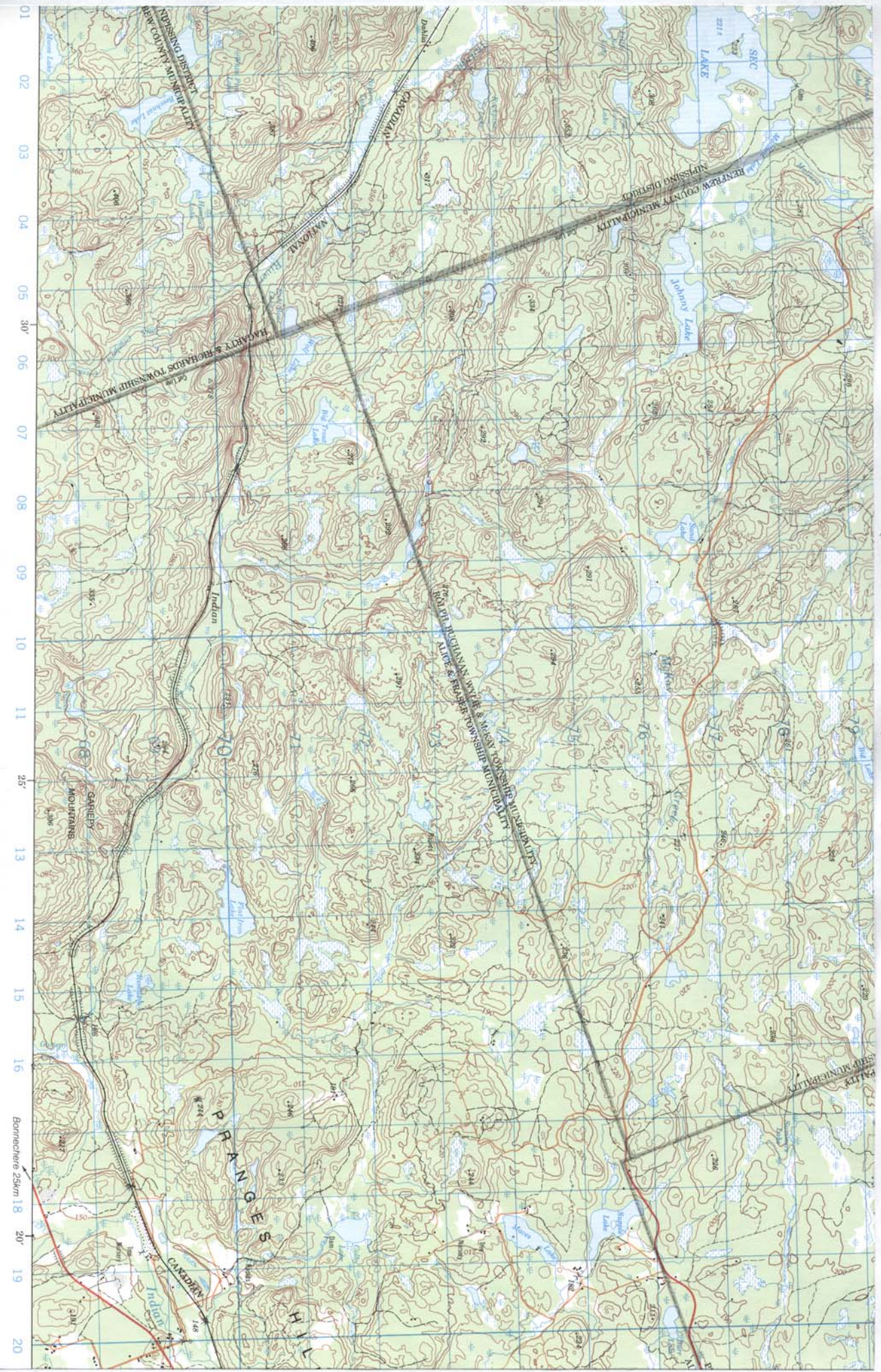
(For use with Unit 10 – Assignment)



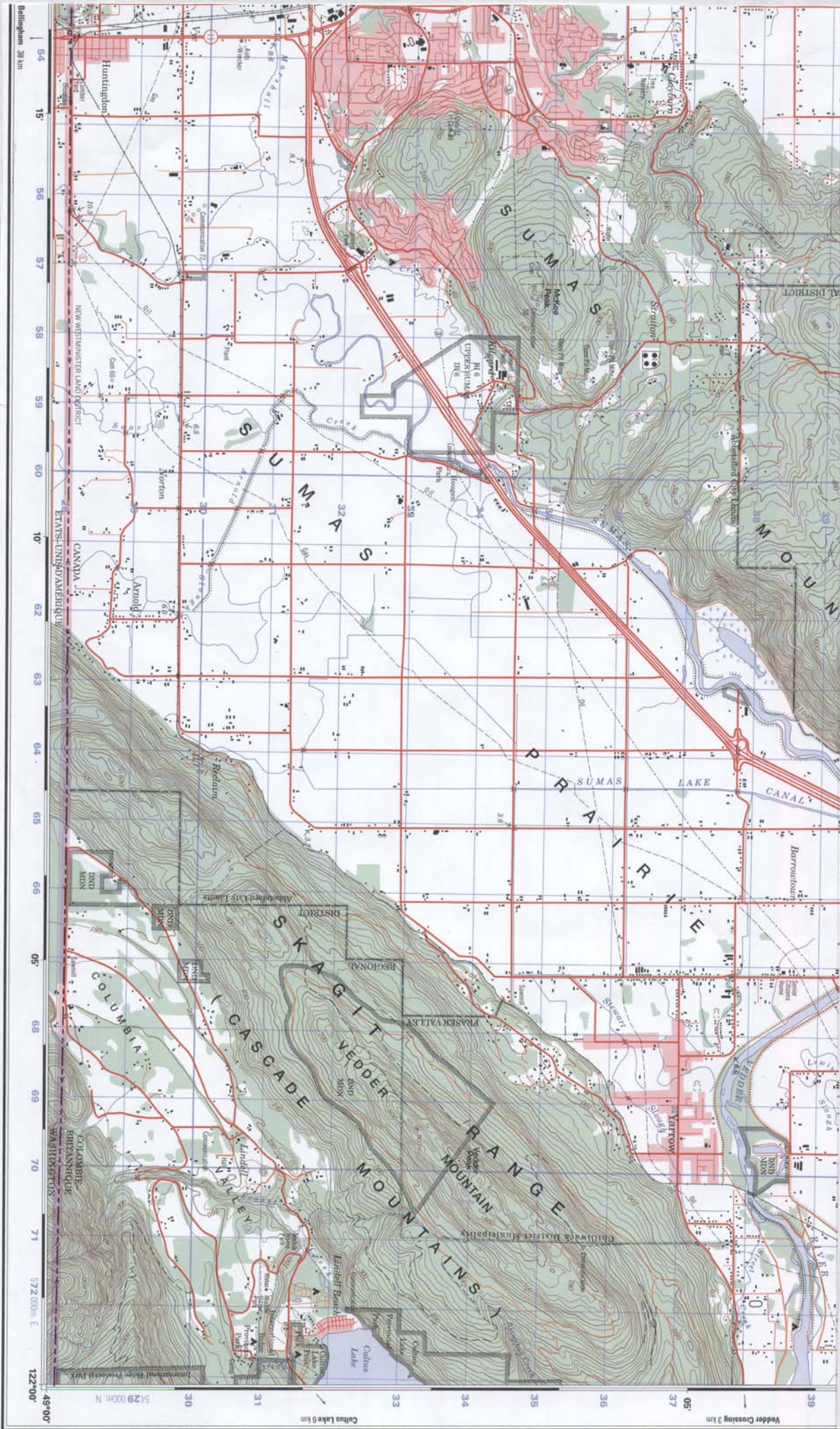
77°37'28" W, 29°00'00" E, 99, 35', 01, 02, 03, 04, 05 To Wyle Station, 30', 07, 08 Deep River 7km, 10, 11, 12, 25', 14, 15, 16

46°03'00.1" N, 51Q2000m N, 01, 5100, 98, 99, 97, 96, 95, 94, 93, 92

(For use with Unit 10 – Quiz 1 and 2)



(For use with Unit 8 – Assignment)



54
15°
56
57
58
59
60
10°
62
63
64
65
66
68
69
70
71
572 500m E
122°00'

39
38
37
36
35
34
33
32
31
30
5129 000m N
49°00'