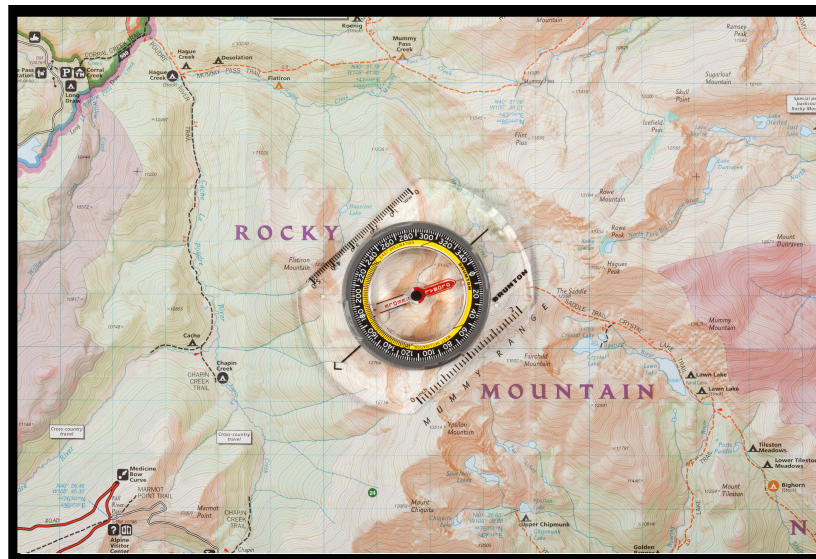




The ABC's of Compass and Map



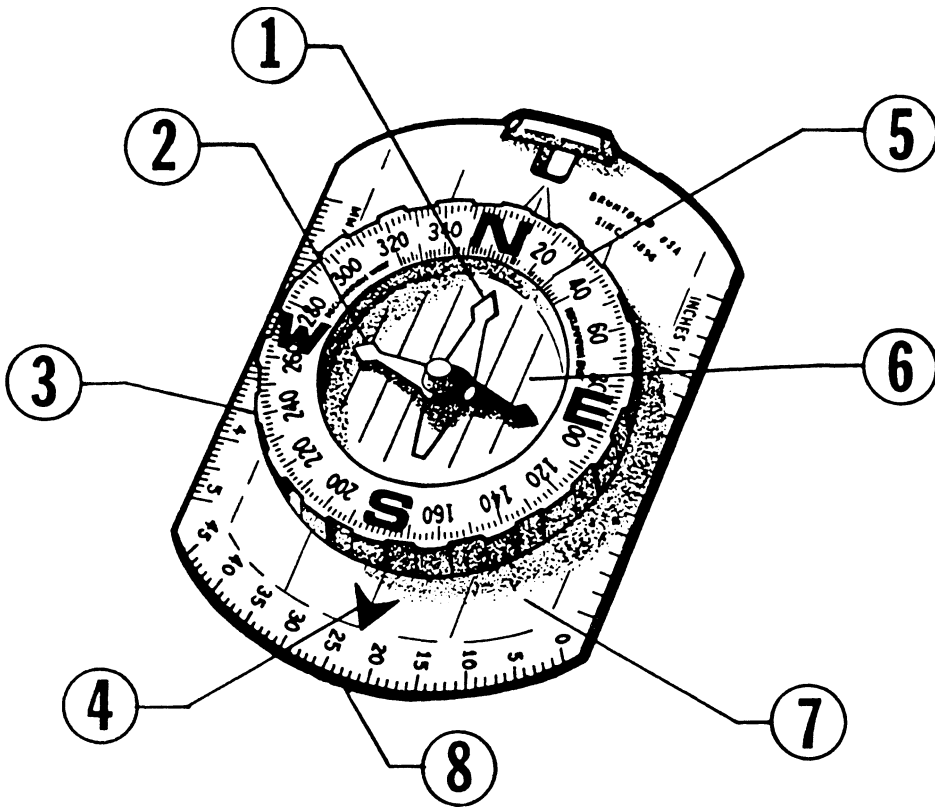
STUDENT WORKBOOK

EXERCISE 1: Compass Part Identification

NOTES:

Directions: Match the terms below with the correct parts on the compass diagram.

- | | |
|----------------------|---|
| A. Azimuth Ring | F. Inch/mm Scale |
| B. Compass Base | G. Sighting Line / Direction of travel arrow. |
| C. Declination Scale | H. Vial |
| D. Acreage Scale | I. Magnifier |
| E. Orienting Arrow | J. Magnetic Needle |



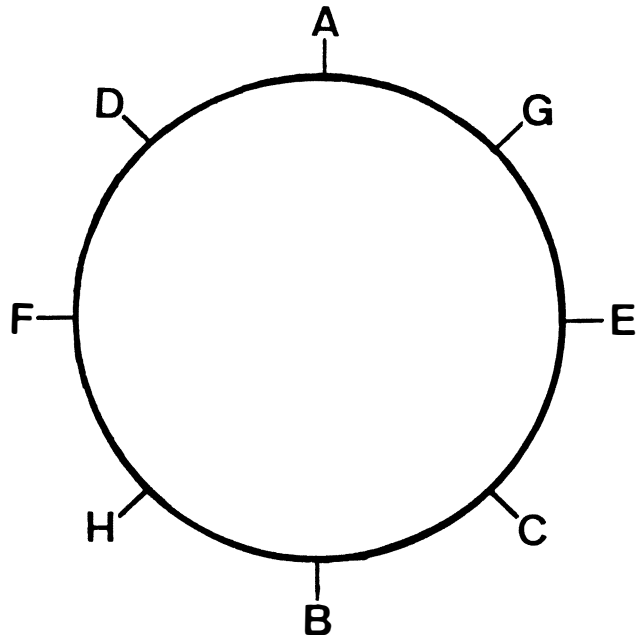
Answers: Write the correct letter in the corresponding blank.

- | | |
|----------|----------|
| 1. _____ | 5. _____ |
| 2. _____ | 6. _____ |
| 3. _____ | 7. _____ |
| 4. _____ | 8. _____ |

NOTES:

EXERCISE 2: Bearings and Direction

Directions: It is important to become familiar with the direction that various bearings represent. Assuming that "A" is zero degrees, give the direction and degree reading for all points.



Answers:

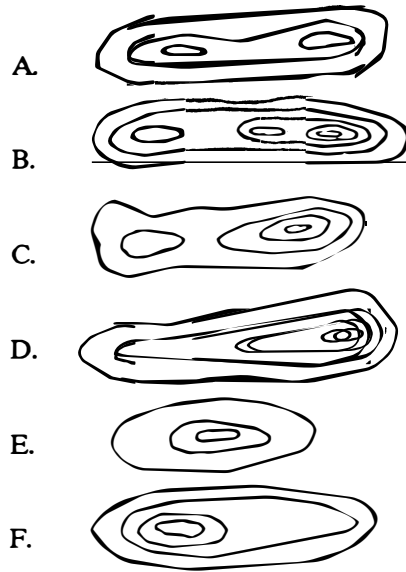
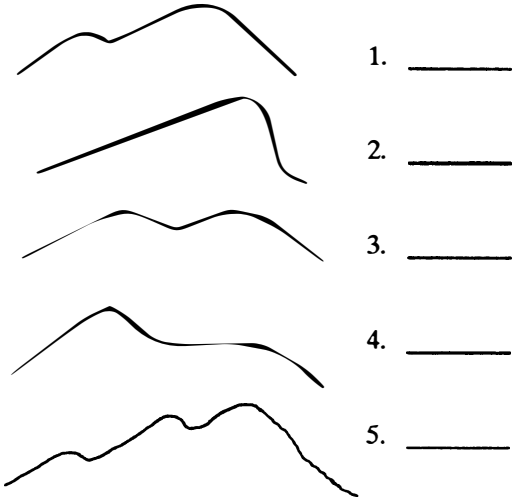
	<u>DIRECTION</u>	or	<u>BEARING / DEGREE</u>
A.	_____		_____
B.	_____		_____
C.	_____		_____
D.	_____		_____
E.	_____		_____
F.	_____		_____
G.	_____		_____
H.	_____		_____

EXERCISE 3: Topographical Features

NOTES:

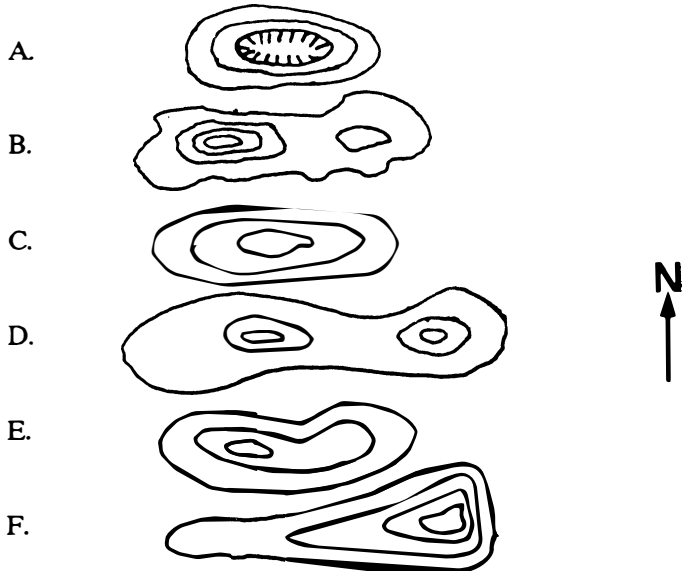
Directions:

A very important part of using a map and compass is to be able to look at a map and visualize what those features look like on the ground. Match the features on the right with the correct feature on the left.



Now match the following description with the correct feature.

- 1. _____ Has two peaks of equal height with a saddle in between.
- 2. _____ Has a crater in the top.
- 3. _____ Has a gradual slope on the west and a steep slope on the east.
- 4. _____ Has two peaks with the west peak being two intervals higher than the east.
- 5. _____ A nice, gradual hill.



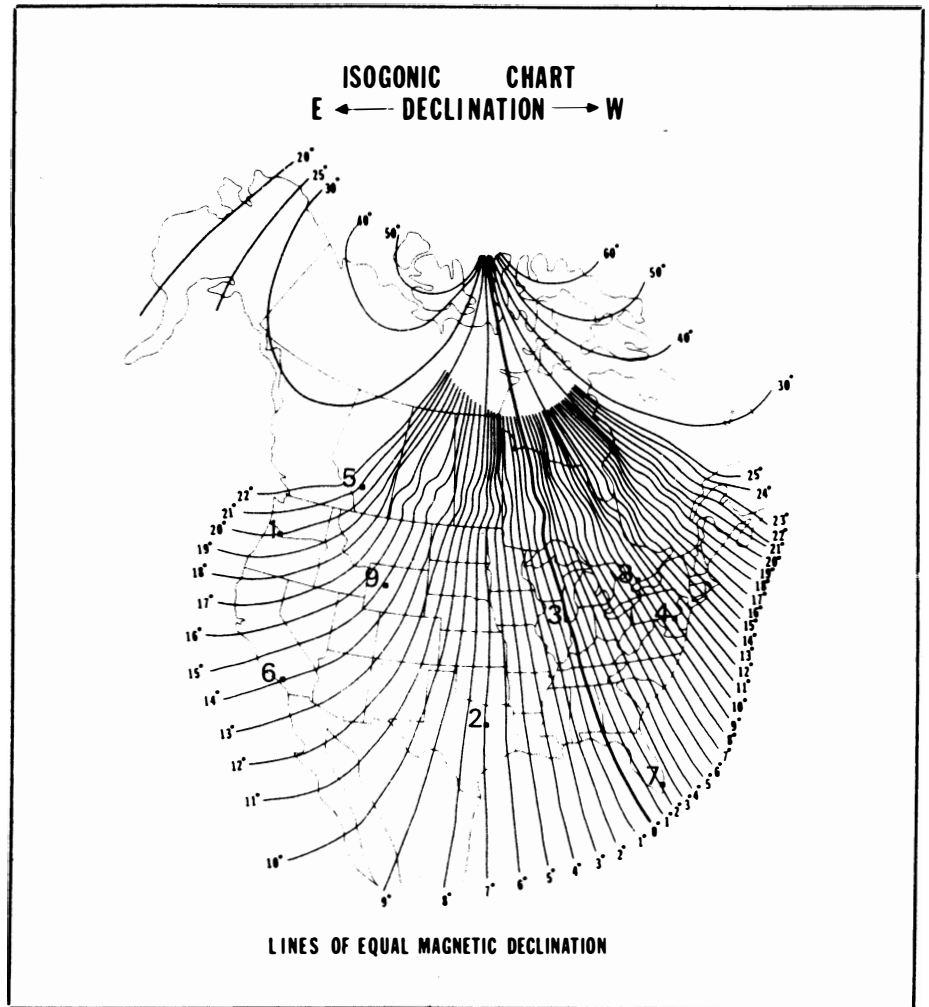
NOTES:

EXERCISE 4: Declination and Isogonic Chart

Declination The angle difference between true north and magnetic north. Can be degrees east or west.

Directions Look at the isogonic chart below and estimate the declination for the following North American cities. Also note if the declination is east or west.

EXAMPLE OF ISOGONIC CHART OF NORTH AMERICA



- 1. Portland, OR
- 2. Dallas, TX
- 3. Chicago, IL
- 4. Washington, DC
- 5. Calgary, Canada
- 6. Los Angeles, CA
- 7. Miami, FL
- 8. Toronto, Canada
- 9. Riverton, WY
- 10. Your City

DECLINATION	EAST/WEST
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

EXERCISE 5: Terms and Matching

NOTES:

Directions: Match the terms below with the correct definition. There is only one correct answer and there are more terms than definitions.

- | | |
|---------------------|-----------------------|
| A. Align | G. Green |
| B. Bearing | H. Isogonic Chart |
| C. Contour Interval | I. Navigational Tools |
| D. Contour Lines | J. Orienting Your Map |
| E. Course | K. Red |
| F. Declination | L. Triangulation |

- _____ 1. The angle difference between True North and Magnetic North.
- _____ 2. This is what you follow when your compass points in the direction you need to travel to reach your desired destination.
- _____ 3. Denotes vegetation on a topographical map.
- _____ 4. Term for setting your compass on the map so that the long edge of the base is on a line from your present location to your desired destination.
- _____ 5. Map of North American continent which has the lines and degree readings showing the difference between True North and Magnetic North.
- _____ 6. Turning your map, with the assistance of your compass, so that it is in the proper perspective to the terrain around you. (North on the map is North on the landscape.)
- _____ 7. Brown lines on the map that indicate elevation.
- _____ 8. Found by holding the compass steady and rotating the azimuth so the "N" on the azimuth is pointed north on the map. (Or, the degree reading or direction from your position to another object or position.)
- _____ 9. Method of finding your exact location on a map by taking bearings of at least two separate, visible objects and transferring that bearing to your map. Where the bearings cross, there you are.
- _____ 10. The rise in elevation between two contour lines. Found at the bottom of the map on the legend.

NOTES:

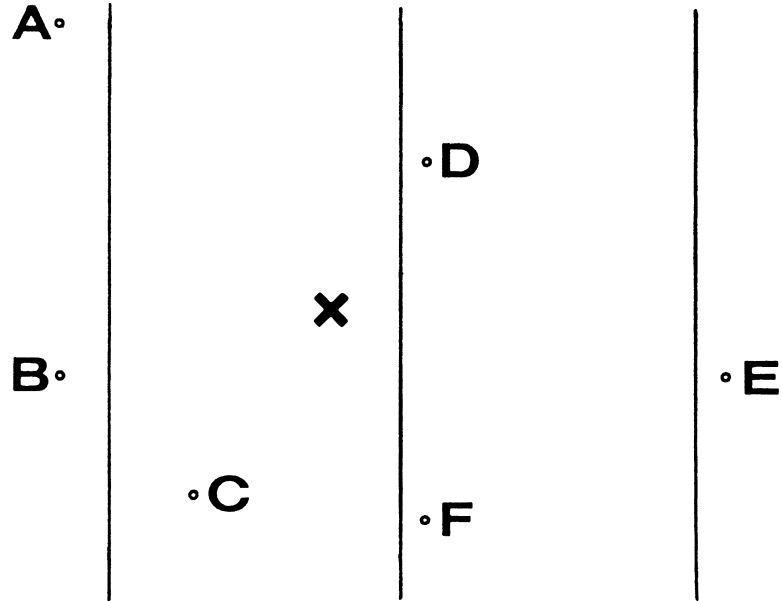
EXERCISE 6: Bearing

Directions: You are at X below. With the declination of your compass set at 0 degrees, determine the bearing from X to each letter. (Go from the center of the X to the center of the dot by each letter.)

Possible Answers:

- 1. 34°
- 2. 316°
- 3. 10°
- 4. 216°

- 5. 100°
- 6. 188°
- 7. 156°
- 8. 256°



Write in the correct number from the possible answers above.

X to A _____

X to D _____

X to B _____

X to E _____

X to C _____

X to F _____

HINTS: When taking a bearing on a map, REMEMBER that the "N" on your azimuth points toward the top of the map (or *the "N" lines* on your map).

EXERCISE 7: Map and Compass Activities

NOTES:

Directions: Look carefully at the sample map. Answer the following questions using all of the knowledge you have learned so far. Declination for this map is 16° east. Be sure you set your compass before you begin. Give the correct answer or letter for each question.

Questions:

1. What is the highest point on the map?
2. What is the elevation of the highest point on the map?
3. What is the name of the highest point on the map?
4. What is the lowest point on the map?
5. What is the approximate elevation of the lowest point on the map?
6. What is the contour interval of this map?
7. What is the elevation of point "G"?
8. Which letter represents the steepest area, "N", "K" or "F"? (Circle one)
9. What is the difference in elevation between point "D" and "M"?
10. Which is higher "G" or "M"? (Circle one)
11. You wish to travel from point "C" to "B", what would be your bearing? (Circle one)
A. 183° B. 243° C. 311° D. 26° E. 206°
12. Suppose you wish to travel from point "C" to "E", at the top of Fossil Hill, what would be your bearing? (Circle one).
A. 3° B. 222° C. 123° D. 48° E. 303°
13. You are standing somewhere along Louis Lake Road but you are not sure where. You can see Fossil Hill. It is at a bearing of 160° from you. You can also see the Middle Fork Guard Station. It is at a bearing of 20° . Use the process of triangulation to find your location on the map. What is your position?
14. More triangulation - You are somewhere along Pete's Lake Trail. You want to find your location using the following information:
According to your map, there are two peaks in a northerly direction from you (point "H" and "I"), but you can only see one of them from where you are standing. The one you can see is at a bearing of 352° from you. The Middle Fork Guard Station is at a bearing of 110° from you.
 - a. What is your location?
 - b. What peak could you actually see?

HINTS: Remember to align N with the north lines on your map.

It may be helpful to orient your map to north.
Refer to the contour interval for elevation.
Use a pencil in case of errors.

Answers:

Exercise 1

1. E Orienting Arrow; 2. J Magnetic Needle; 3. A Azimuth Ring;
4. G Sighting Line/DOT Arrow; 5. C Declination Scale; 6. H Vial; 7. B Compass Base; 8. F inch/mm scales

Exercise 2

- A North 360°; B. South 180°; C. Southeast 135°; D. Northwest 315°; E. East 90°; F. West 270°; G. Northeast 45°;
H. Southwest 225°.

Exercise 3

- 3A 1. C; 2. D; 3. A; 4. F; 5. B
3B 1. D; 2. A; 3. F; 4. B; 5. C

Exercise 4

1. 20° East; 2. 7° East; 3. 0; 4. 10° West; 5. 21° East; 6. 14° East; 7. 2° West; 8. 9" West; 9. 15° East; 10.

Exercise 5

1. F; 2. E; 3. G; 4. A; 5. H; 6. J; 7. D; 8. B; 9. L; 10. C

Exercise 6

- X to A 316°; X to B 256°; X to C 216°; X to D 34°; X to E 100°; X to F 156°

Exercise 7

1. E; 2. 9089 Feet; 3. Fossil Hill; 4. T; 5. 6760 Feet; 6. 40 Feet; 7. 8280 Feet; 8. N;
9. 1,000 Feet; 10. M; 11. D - 26°; 12. C - 123°; 13. B; 14a. A. 14b. H

ABC Method - Review

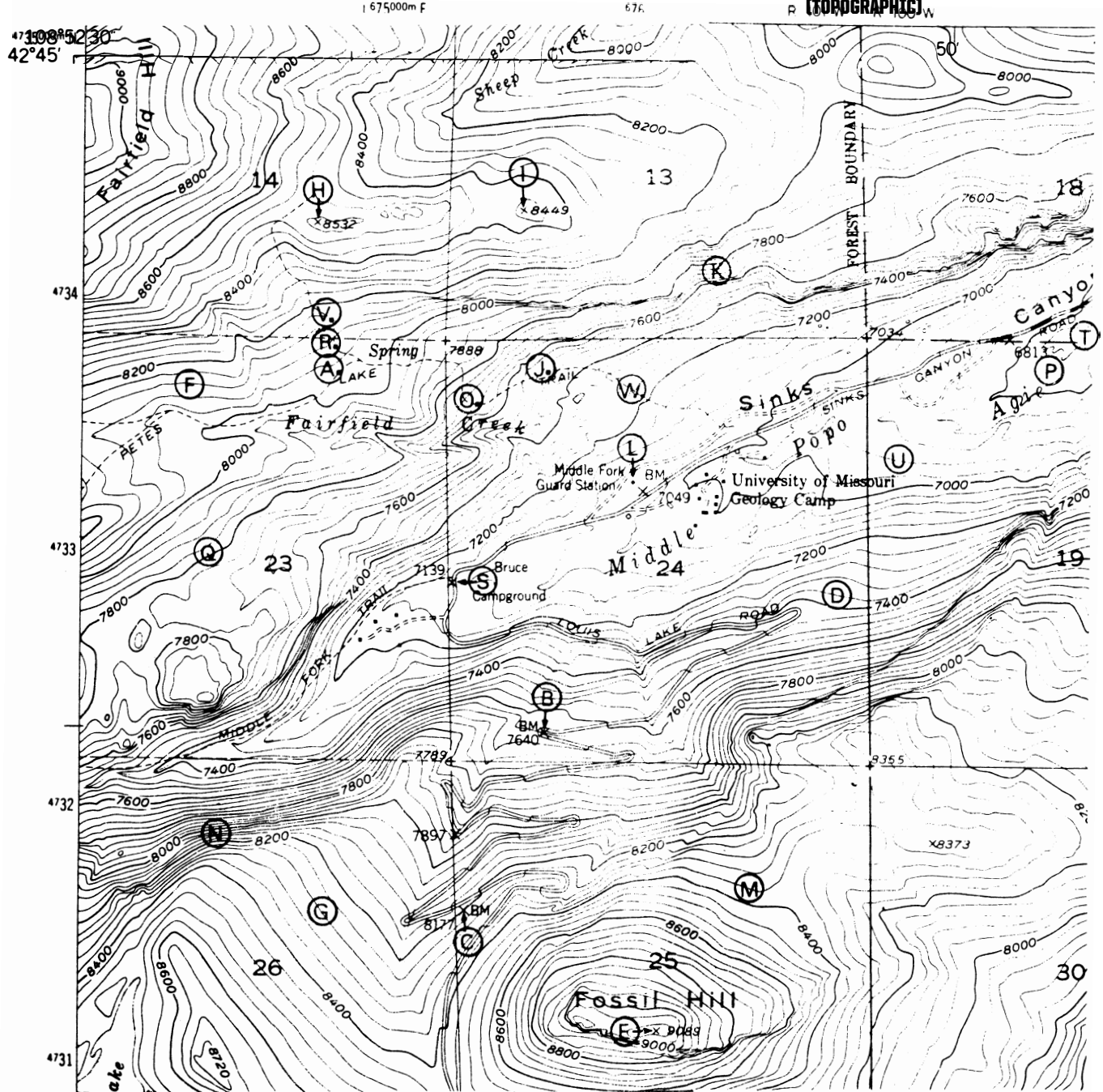
- Align** your compass on the map so that the long edge of the base is on a line from your present location to the desired destination.
- Bearings** are found by holding the compass steady and rotating the dial (azimuth) so that the "N" on the azimuth is pointed north on the map. Your bearing now appears on the dial at the direction of travel arrow.
- Courses** are followed by picking up the compass and holding it in a horizontal position so that the magnetic needle is free to rotate. Pivot yourself until the orienting arrow is aligned with the magnetic needle. The compass now points in the direction you need to travel to reach your desired destination.

This course is designed to teach you the basics of map and compass use and it should be understood that it is providing guidelines only. To become more proficient at using a compass and map together, we urge you to further your skills through education, reading, and practice. Remember, pre-trip planning and preparedness are essential for a safe outdoor trip.

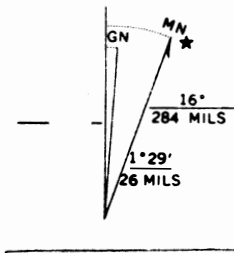
UNITED STATES
DEPARTMENT OF THE INTERIOR
Geological Survey

1:675000m F

FOSSIL HILL QUADRANGLE
WYOMING-FREMONT CO.
7.5 MINUTE SERIES
(TOPOGRAPHIC)



SAMPLE MAP



CONTOUR INTERVAL 40 FEET