

The Altitude—Azimuth Coordinate System

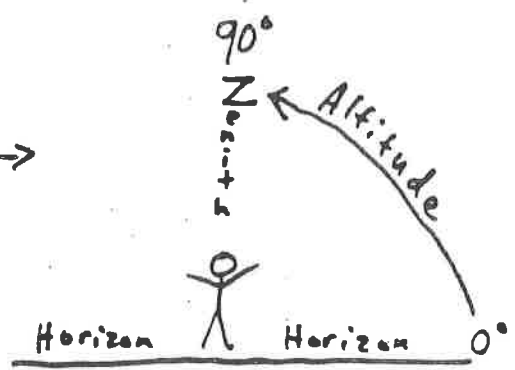
Name _____

Date _____

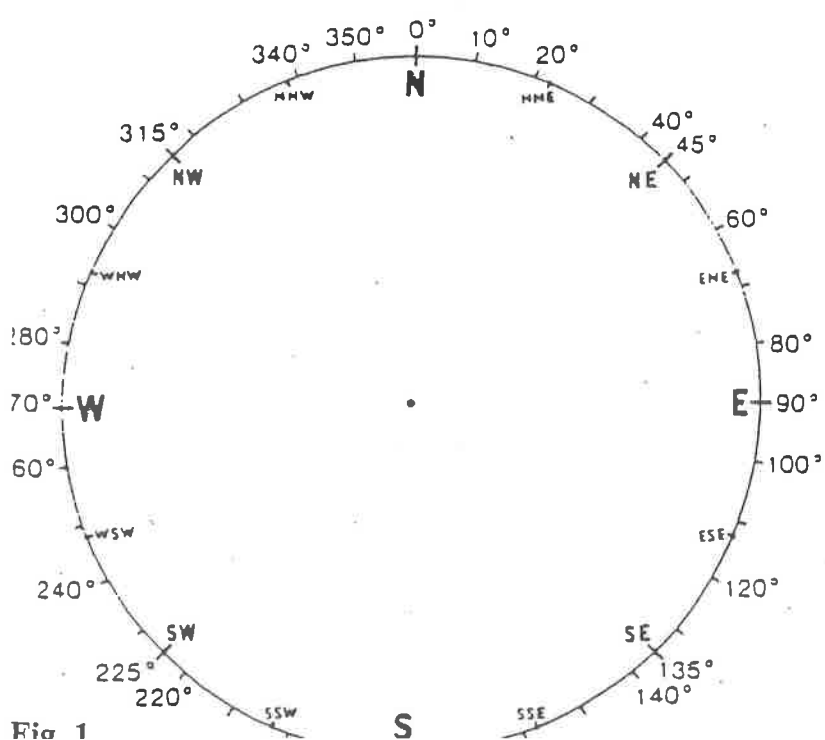
Period _____

To become familiar with the Alt-Azimuth coordinate system. This system is a very simple one and very often used. You use its azimuth part every day you drive a car. The highways are designed as E 66 or W 24 or N 101 or S 101, etc. You use the points of the compass to denote a direction. An alt-azimuth system is used by a tripod, for example. However, the photographer usually does not care to read any angles. The camera is moved horizontally about an axis—it moves through azimuth angles; it also can be moved perpendicularly to this horizontal plane—through an altitude angle.

The alt-azimuth system consists of a reference plane, the horizon plane and its pole, the zenith. The azimuth is measured along the horizon, starting with 0° at the Northpoint, in an easterly direction, with East (E) 90°, South (S) 180°, West (W) 270° and finally North (N) with 360° or 0°. The altitude is measured from the horizon with 0° upwards to the zenith with 90°. In addition to the four cardinal points of the compass, N, E, S, and W the half-way direction between any of them is commonly used, namely NE, SE, SW, and NW. A still finer division of the azimuth scale denotes the halfway mark between N and NE as NNE—which means north of northeast. ENE means east of NE. Similarly for the other directions. However, the use of this terminology should be restricted in the following way: If an object is E of an observer, it has an azimuth of 90°; if it is NE of an observer, it has an azimuth of 45°; if it is ENE of an observer, it has an azimuth of 67.5°.



If you do not wish to denote the direction to an object too accurately and merely wish to say that it is somewhere to the north of East, then you should say so in words, namely North of East. You should NOT say: NE because that specifies a well defined direction, namely 45° azimuth. Study Fig. 1 for angles and points of the compass. In astronomy the alt-azimuth system is very often used to describe objects which change relatively fast. For example, locations of comets, conjunction of planets, satellite orbits, etc.



Points of the compass with corresponding azimuth angles.

Fig 1

Name _____ Date _____ Period _____

Give the corresponding azimuth values for the following points of the compass:

- 1) NE _____
- 2) NNE _____
- 3) ENE _____
- 4) SE _____
- 5) ESE _____
- 6) SSE _____
- 7) NW _____
- 8) NNW _____
- 9) WNW _____
- 10) SW _____
- 11) SSW _____
- 12) WSW _____

Answer in the empty spaces:

<u>Description of event</u>	<u>Points of compass</u> (use E, NE, NNE, etc)	<u>Azimuth in</u> <u>degrees</u>	<u>Altitude</u> <u>in degrees</u>
1) The sun rises exactly East			
2) The sun rises exactly ESE			
3) The sun sets 22.5° north of west			
4) The moon is exactly south & halfway between horizon & zenith			
5) The moon is directly overhead			
6) The moon sets exactly west			
7) A satellite "rises" at 8:00 p.m. exactly at WNW			
8) Two minutes later it passes through the zenith. Where will it "set" at 8:04 p.m. ?			