Name_____ Date_____ Period_____

Strike and Dip

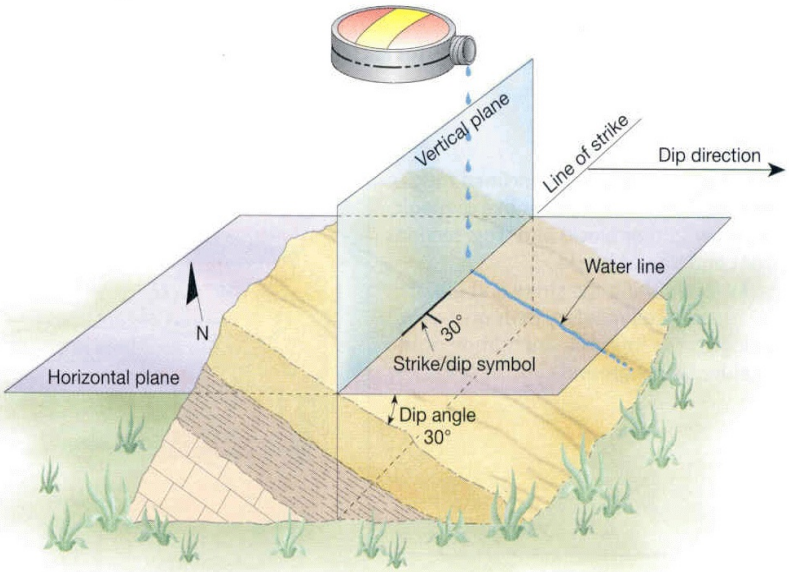
Introduction

As in most fields, one of the primary goals of research, etc. is for making money. Geology, as you have already seen, is no exception. The search for mineral and rock resources is not a random one. Prices to drill for ores and other valuable commodities is very expensive and must be conducted systematically and only after a full understanding of the underlying geology is gained. Part of this understanding must come from recognition of certain basic geologic structures whose presence is often the determining factor between striking it rich and finding financial ruin.

For geologists, the difficulty of finding resources is made even more complex due to the fact that they must work in three dimensions. In other words, they must be able to evaluate not only what is at the surface but also what is below it. Two measurements in specific are used to assist geologists in evaluating subsurface rock layers and their specific layers. The first, strike (trend), is the compass direction of the line produced by the intersection on an inclined rock layer or fault with an imaginary horizontal plane at the surface. The strike of the rock layers is expressed as an angle relative to North. For example, a strike of "north 10º east" (N10ºE) means the strike is ten degrees to the east of north. In Figure 1, the strike of the rock layers is approximately north 60º east (N60ºE).

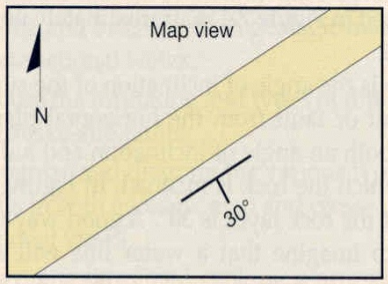
Dip, the second measurement, is the angle of inclination of the surface of the rock unit from the horizontal plane. Dip includes both an angle of inclination and a direction toward which the layers are inclined. The direction of the dip will always be at a 90º angle to the strike.

On a typical geologic map, strike and dip are shown with a long line drawn in the direction of the strike and a short line extending from the center of the long one to show the direction of the dip. At the end of the short line will be an angle measurement that shows the extent of the dip.



Exercise 1

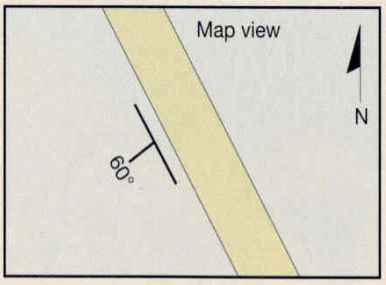
Fill in the requested information for each strike/dip example provided below.



Strike: North _____°_____

Direction of dip: _____

Angle of dip: _____°



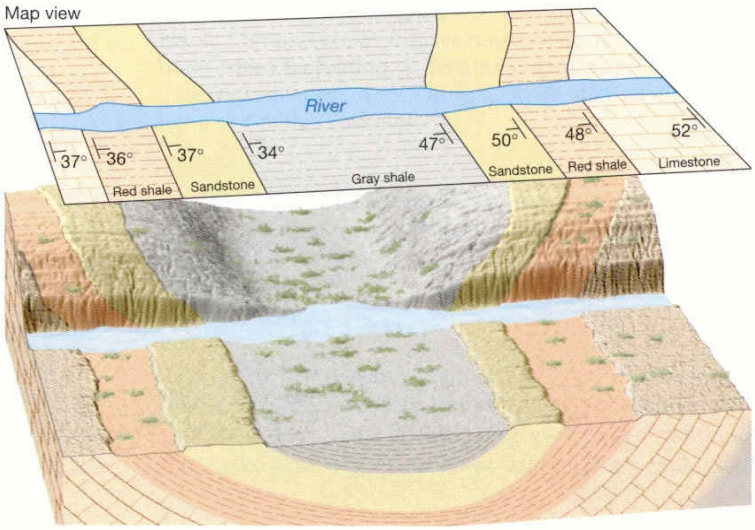
Strike: North _____°_____

Direction of dip: _____

Angle of dip: _____°

Block Diagrams

Block diagrams allow geologists to show both a geologic map view and geologic cross sections (the view from the side or below the surface). A typical block diagram and the "hidden" information they can show is illustrated at right.



Exercise 2

Using the above block diagram as a template, complete the block diagrams on the next page including both the map view and the cross sections. This exercise takes a bit of practice and "spatial" thinking so be sure to use pencil until you are sure of what you are drawing. For the fourth example, both the map view and cross section have been left blank. In that diagram, chart the following information:

1. Four sedimentary layers of equal thickness exposed at the surface
2. The strike of each layer is N45°W
3. The direction of the dip of each layer is to the northeast
4. The angle of the dip of each layer is 60°

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Diagram Exercises

Diagram 1

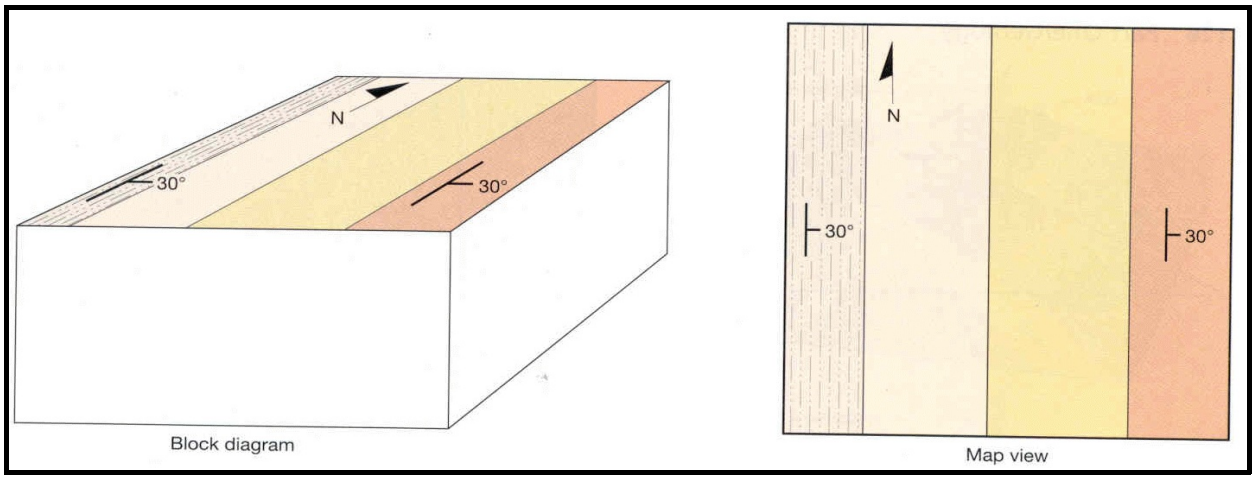

Diagram 2

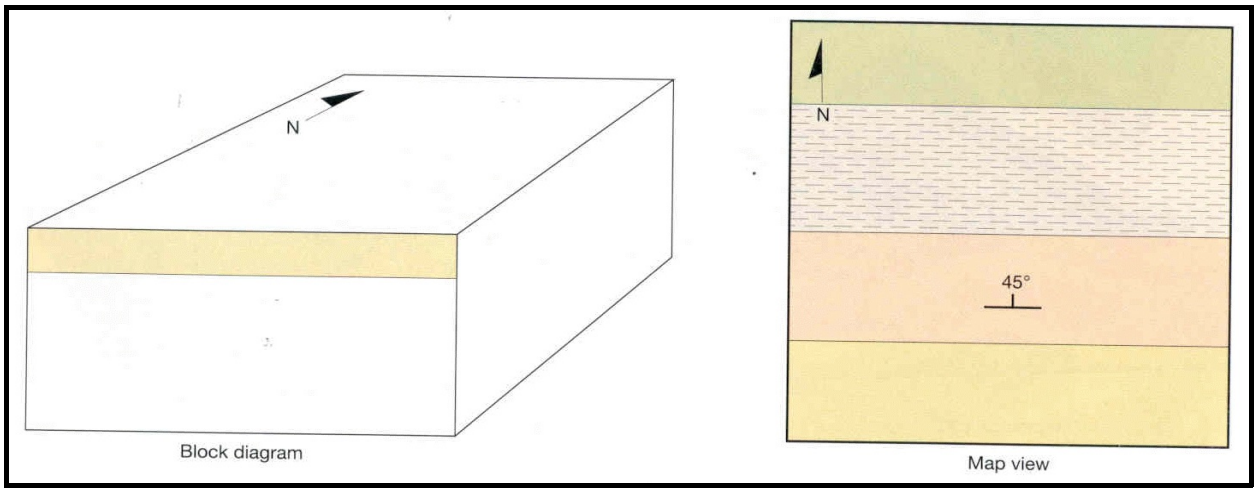

Diagram 3

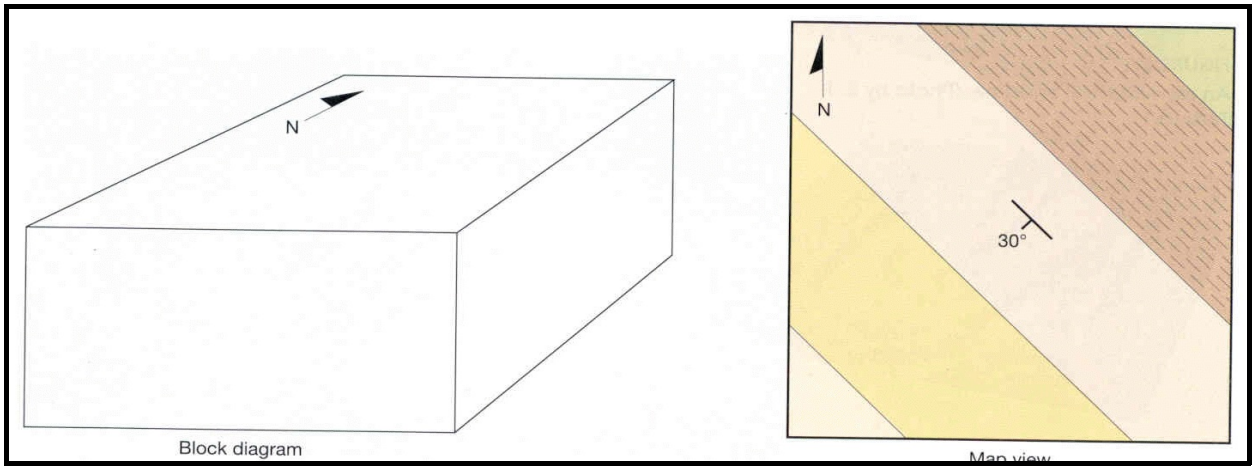

Diagram 4