

WJEC Eduqas GCE AS in
GEOLOGY

P15

Measurement of dip and strike elements: dip angle, dip and strike directions of planar surfaces, relevant to an investigation

Title: P15 Measurement of dip and strike elements: dip angle, dip and strike directions of planar surfaces, relevant to an investigation

Specification reference: 2.3b

Aim: To measure dip and strike elements: dip angle, dip and strike directions of planar surfaces, relevant to an investigation.

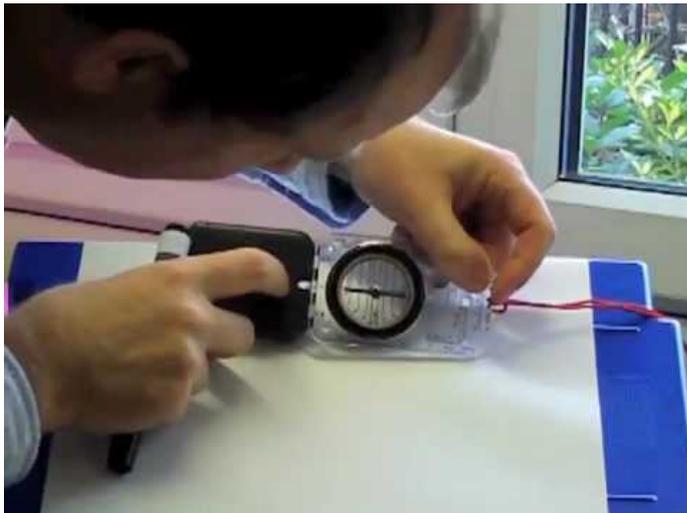
Apparatus:

Compass clinometer (or separate compass and clinometer)

Method:

1. Strike direction

- Set the compass clinometer to East-West by turning the bezel so that the values 90 and 270 intersect the markers on the compass which are often a pair of fluorescent dashes. This puts the compass clinometer in clinometer mode.
- Hold the clinometer vertically and place it on its long edge on the plane (e.g. a bedding plane).
- Move the clinometer round, on its long edge, keeping it vertical, until the clinometer reading is zero.



Havering sfc YouTube <http://bit.ly/2k6DqIC>

- Draw a line on the plane, using chalk in the field. This line is the direction of strike.
- Turn the compass clinometer horizontal, so that it is now in compass mode.
- Point the long axis of the compass along the chalk line representing the direction of strike.



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- Turn the dial of the compass (the bezel) so that red suspended arrow overlies the red arrow in the base of the bezel.



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- Read off the direction of the strike on the rim of the bezel where the rim intersects the “marker” which is often a fluorescent “dash”. There are two of these and it does not matter which is used. They will be 180 degrees apart.
- Record the direction of strike as a 3 digit number. If the directions of strike are 8° and 188° , this is recorded as either 008° or 188° .

2. Angle of dip

- Put the compass clinometer into clinometer mode again. (Set the compass clinometer to East-West by turning the bezel so that the values 90 and 270 intersect the markers on the compass which are often a pair of fluorescent dashes.)
- Hold the clinometer vertically and place it along its long edge on the plane. Move the clinometer round, on its long edge, keeping it vertical and in contact with the rock, until the clinometer reaches its maximum reading. This is the true dip reading and happens when the clinometer is pointing down the plane at 90 degrees to the direction of strike.



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- Read off the dip angle by reading off where the arrow, which hangs down inside the bezel, intersects the scale in the inside of the bezel. The value will be between 0 and 90.
- Record the angle of dip as a two digit number e.g. 42°.

3. Direction of dip

- The direction of dip will be at a bearing of 90° from the direction of strike.
- It is the direction to which the plane loses height, the direction to which the angle of dip reading was taken.
- It can be recorded as a compass direction e.g. S, W, NW, SE etc.

A complete dip and strike reading for a planar surface such as a bedding plane should be recorded in the following way.

Strike direction (3 digits)/Dip angle (2 digits)/Dip direction (a compass direction)

e.g. 188/42/E

4. Apparent Dip

On occasions it is not possible to place a compass clinometer on a 3-dimensional outcrop of a planar surface and only a 2-dimensional view of a dipping plane is visible e.g. in the face of a cliff. In such cases a plane can be seen to be dipping but it is not possible to determine the direction of strike of the plane, nor therefore to determine the true dip direction.

In these situations all that can be recorded is the angle at which the plane appears to be dipping (recorded as 2-digits) and the direction to which the plane appears to be dipping (recorded as a 3-digit bearing). These readings record the Apparent Dip of the plane rather than the True dip of the plane and this must be noted alongside the readings.

e.g. 32/185 Apparent Dip

Repetition of readings: Planar surfaces in geology are often irregular. For this reason one reading of dip and strike may not be representative of a planar surface or of a series of planar surfaces.

It may be worth taking more than one reading of dip and strike on a plane or on a concordant series of adjacent planes in order to increase the accuracy of measurements.

Sampling: Where a series of dip and strike readings are to be taken for an investigation into a sequence of folds for example, a sampling method should be used to ensure that the readings are representative of those required for the investigation. The pros and cons of various sampling methods (random, systematic, stratified) should be considered before a sampling strategy is chosen.

Analysis:

Analysis of the data relevant to an investigation

Teacher/Technician notes

Video examples of how to take dip angle, strike direction and dip direction can be found on Youtube e.g.

<https://www.youtube.com/watch?v=FbXhoadhZw>

<https://www.youtube.com/watch?v=VCN2q6xwTNk>

and also on video clips at

<http://www.esta-uk.net/fieldworkskills/video%20clips.htm>