Draw a cross-section

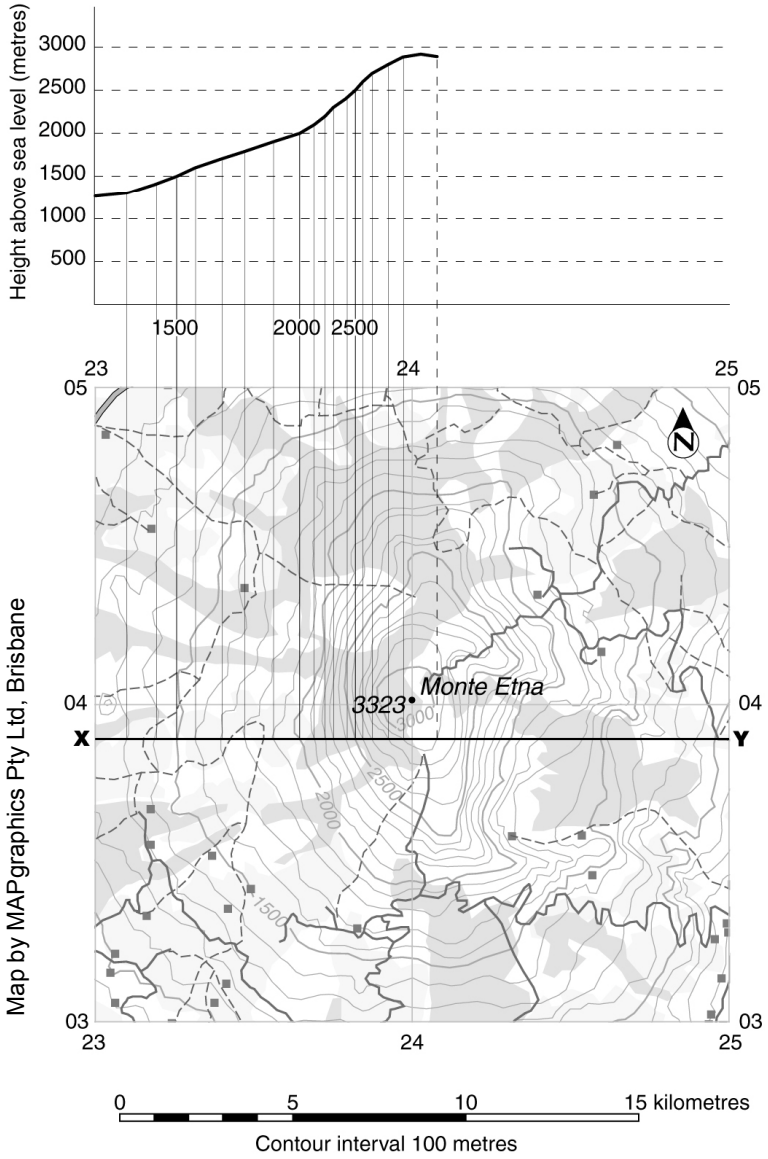
A cross-section shows the shape of a feature (such as a mountain) viewed from the side, as if cut through with a knife. Cross-sections are constructed using the contour lines on a topographic map. (You may like to refresh your memory about topographic maps by reading the information box on page 2 of this worksheet.)

In this worksheet, you will draw two cross-sections from the topographical map of Mt Etna included on page 3. (You may find it easier to draw these if you first enlarge the map on a photocopier.) On completion, explain in a couple of paragraphs any similarities and differences in the two cross-sections, and what this tells you about the terrain in each case. Your cross-sections will be drawn between:

- grid reference 227033 (name it A) and grid reference 252047 (name it B)
- grid reference 239054 (name it C) and grid reference 241026 (name it D).

In each case you will start and finish on a contour line. This will mean making a very minor adjustment for your start and finish points, once you have pinpointed your grid references.

Cross-section of Mount Etna from point X to point Y



The following example is provided to remind you how to draw a cross-section.

Drawing a cross-section

1. Line up the edge of a piece of plain paper along the line marked XY.
2. Make a small vertical mark on your paper where each contour line meets it. Also draw small marks below X and Y and label them X and Y. Near each vertical mark, write the height of the contour. (Use the contour interval to help you work this out.)
3. Line up your marked-up piece of paper against a graph you have drawn. **Your graph should be exactly the same width as the length of the line between X and Y.** Line up the X with the vertical axis of your graph. For each vertical mark on your piece of paper make a corresponding dot on your graph (to record the height of the contour above sea level).
4. Join the dots to create your cross-section. The first 18 have been plotted for you here.
5. Give your cross-section a title. If you wish, you could shade the area under the line, so that the shape of your completed cross-section is clearer.

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Topographic maps

Topographic maps show the relief (height and shape) of the land using contours. They also show physical features such as forests, rivers and lakes and human-made features such as roads, railways and settlements. The key on a topographic map uses conventional signs to show the major features.

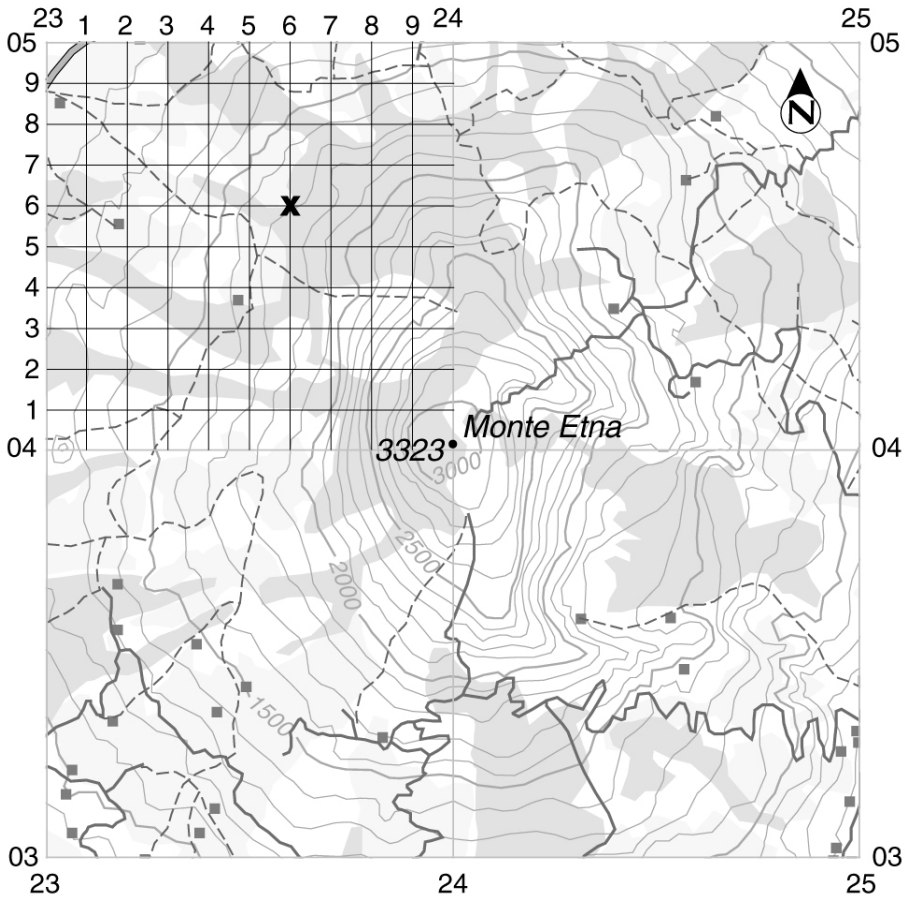
Contour lines

Contour lines are superimposed on topographic maps. These are numbered lines that join places of equal height above sea level on a map. Contours show the height, shape and location of hills and mountains in a landscape. The difference in height between one contour line and the next is always the same. This is known as the contour interval.

On any contour map, evenly spaced contours mean an even slope, close contours mean a steeper slope and widely spaced contours mean a gentle slope or flat area. Spot heights are also given to show the actual height of particular locations. The highest points of a region are usually shown with spot heights.

Grids on a topographic map

A square grid is superimposed on topographic maps. These grids are numbered with two-digit numbers on the map's margins. Lines that run up and down the map (north/south) are called *eastings*, because the numbers increase as you move east. The lines running across the map (east/west) are called *northings* because the numbers increase as you move north. Easting and northing numbers can be put together to form a four-figure grid reference — the easting is always given first (e.g. 2304).



Contour interval 100 metres

This six-figure grid reference of point **X** is

23 6 — From the eastings

04 6 — From the northings

That is: 236046

Four- and six-figure grid references

The four-figure area reference will tell you the grid square in which a feature will be found. To pinpoint a more precise location of a feature, a six-figure grid reference is required. To work out the six-figure grid reference of a particular point on a map, you need to imagine that the distance between two eastings and two northings can be divided into 10 equal segments (tenths). These imaginary lines divide the spaces between one easting and the next into 10 equal columns, and the spaces between one northing and the next into 10 equal rows

By way of example, an extract from the Mount Etna topographic map has been included above. You will note that the point to be identified (X) lies in the grid formed by eastings 23 and 24 and northings 04 and 05. Estimate on which imaginary lines between these two eastings and two northings this point is located. This will give you the third and sixth numbers respectively for your six-figure grid reference (e.g. 236046).

Reference: *SOSE Alive 3*, pp. 108–9 ▪ *SOSE Alive Geography 2*, pp. 12–13

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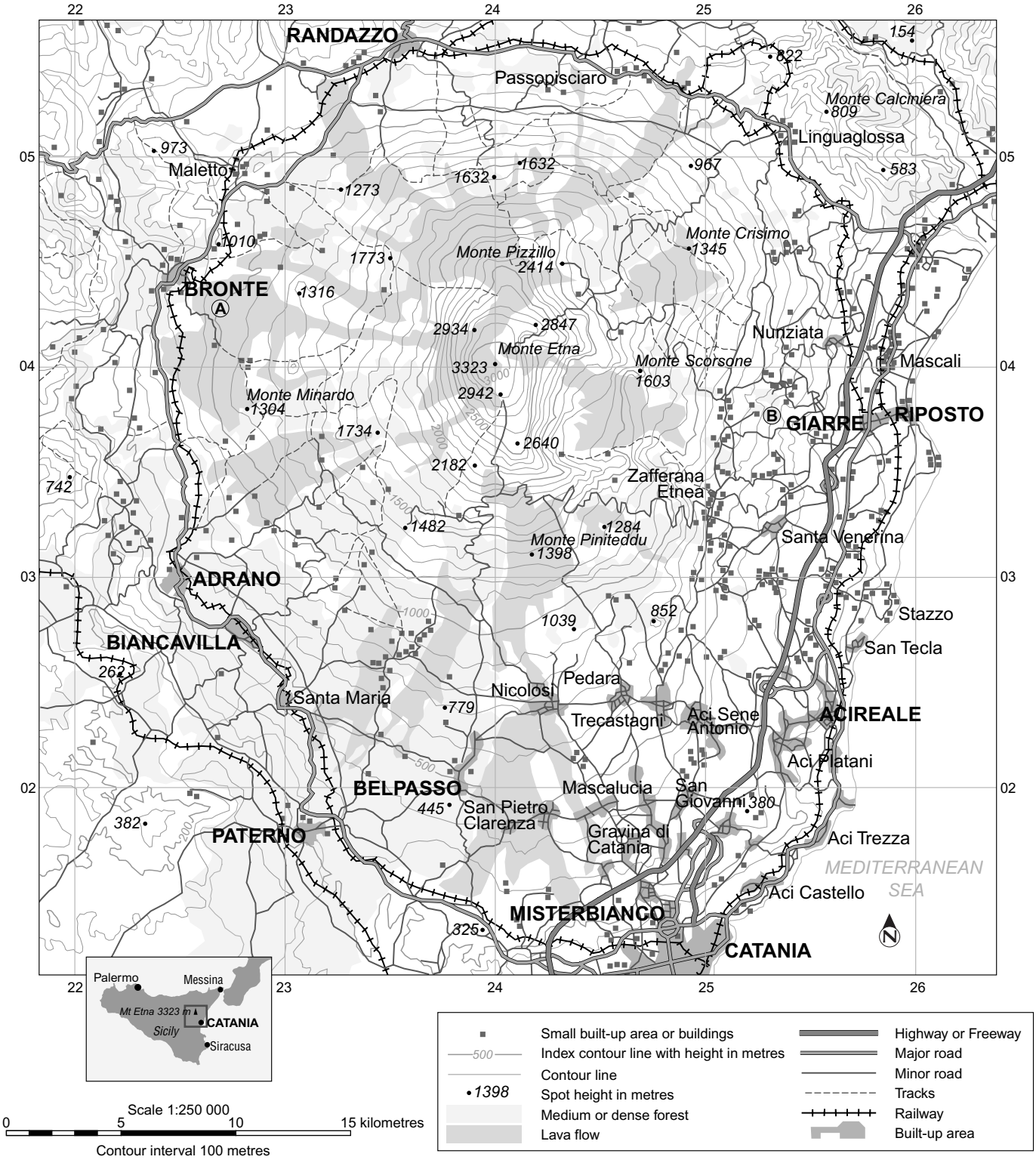

Map by MAPgraphics Pty Ltd, Brisbane