



Contour lines on a map indicate the shape of slopes. Areas where contour lines are close together have steep slopes, while areas where there are only a few spaced-out contour lines are very gentle slopes (Figure 1.5b).

The spacing of the contour lines also indicates the shape of the slope. When the spacing of contour lines increases, the slope is *convex*. When the spacing of contour lines decreases (reading from high to low), the slope is *concave*. (See Figure 1.5c.)

The use of topographic maps can help you understand the shape of particular features and the patterns created by the contour lines. Some examples of common landform features and their associated contour patterns are shown in Figure 1.5d.

The *contour interval* is the difference in elevation between two adjacent contour lines. The contour interval is always constant on a map.

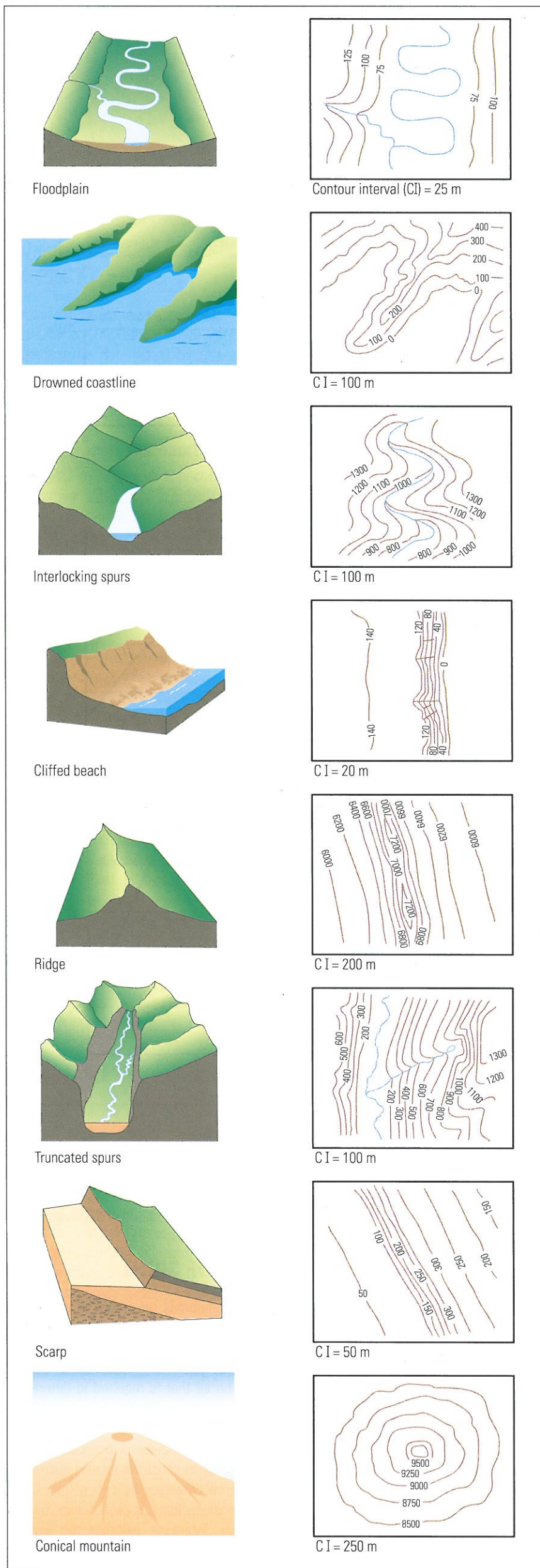
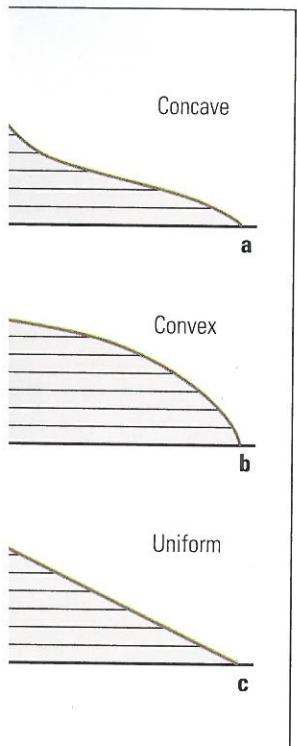
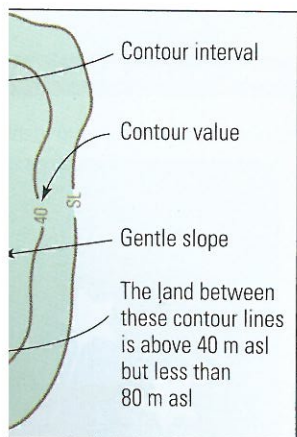


Figure 1.5d Common landform features and their contour patterns.

## ESTIMATING HEIGHT

In the absence of a spot height, it is possible to estimate the height above sea level of a feature by studying the contour lines on a topographic map.

### EXAMPLE 1

Estimate the height of the hill at point A in Figure 1.5e. Point A lies above 200 m but is obviously less than 250 m. Your answer should be expressed as a statement, that is 'Point A is more than 200 m but less than 250 m above sea level' or 'Point A is >200 m but <250 m'.

### EXAMPLE 2

Estimate the height of point B in Figure 1.5e. Point B lies between the 50 m and 100 m contour lines. Your answer should be expressed as a statement, for example 'Point B is >50 m <100 m'.

*Note:* In some cases it may be possible to express your answer as an estimate, but check with your teacher to see whether this method is acceptable. If you can express your answer as an estimate, your answers would be:

- *Example 1.* 'Point A is approximately 225 m' (or any number between, but not including, 200 m and 250 m).
- *Example 2.* 'Point B is approximately 75 m' (or any number between, but not including, 50 m and 100 m).

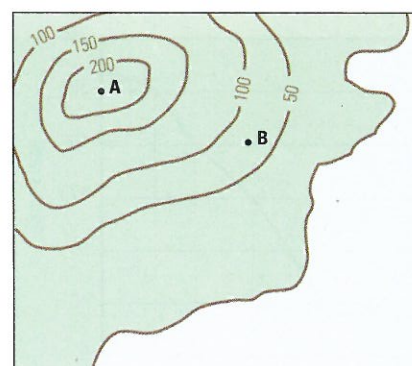


Figure 1.5e Contour sketch.

## CALCULATING LOCAL RELIEF

*Local relief* is the variation in height over a relatively small, defined area. It is determined by calculating the difference in height between the highest and lowest points in the area.

### EXAMPLE

Calculate the local relief experienced in a traverse (walk) between points X and Y in Figure 1.5f.

$$\begin{aligned} \text{Highest point} - \text{lowest point} \\ &= 150 \text{ m} - 50 \text{ m} \\ &= 100 \text{ m} \end{aligned}$$

*Note:* Always make sure that you include the appropriate unit of measurement with your answer.

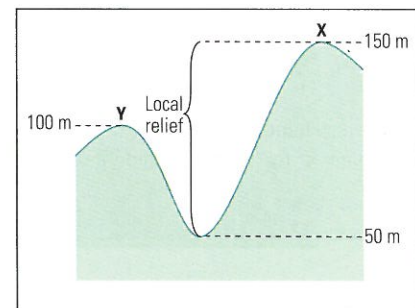


Figure 1.5f Calculating local relief.

## CROSS-SECTIONS

A cross-section is a side view (or profile) of the land. Drawing a cross-section from a topographic map is a useful way of interpreting contour lines and gaining a visual impression of the shape of the land. The following method can be used when drawing a cross-sectional profile between two points; in this case points A and B.

### Drawing a cross-section

Drawing a cross-section involves the following steps:

- Step 1** Place the straight edge of a piece of paper along a line joining points A and B. Mark points A and B on your sheet of paper. (See Figure 1.5g (i) on page 12.)
- Step 2** Starting from Point A, mark the position where the edge of your sheet of paper cuts each contour line. Write the value of each contour on your sheet of paper. (See Figure 1.5g (ii).)
- Step 3** Draw the horizontal and vertical axis for your cross-section. The length of the horizontal axis should equal the length of the line A–B. The vertical axis, showing the height of the land above sea level, should use a scale that is appropriate to your needs.
- Step 4** Place your sheet of paper along the horizontal axis and then plot the contour points and heights as if you were drawing a line graph. (See Figure 1.5g (iii).)
- Step 5** Join the dots with a single smooth, curved line and then shade in the area under the line to highlight the relief.