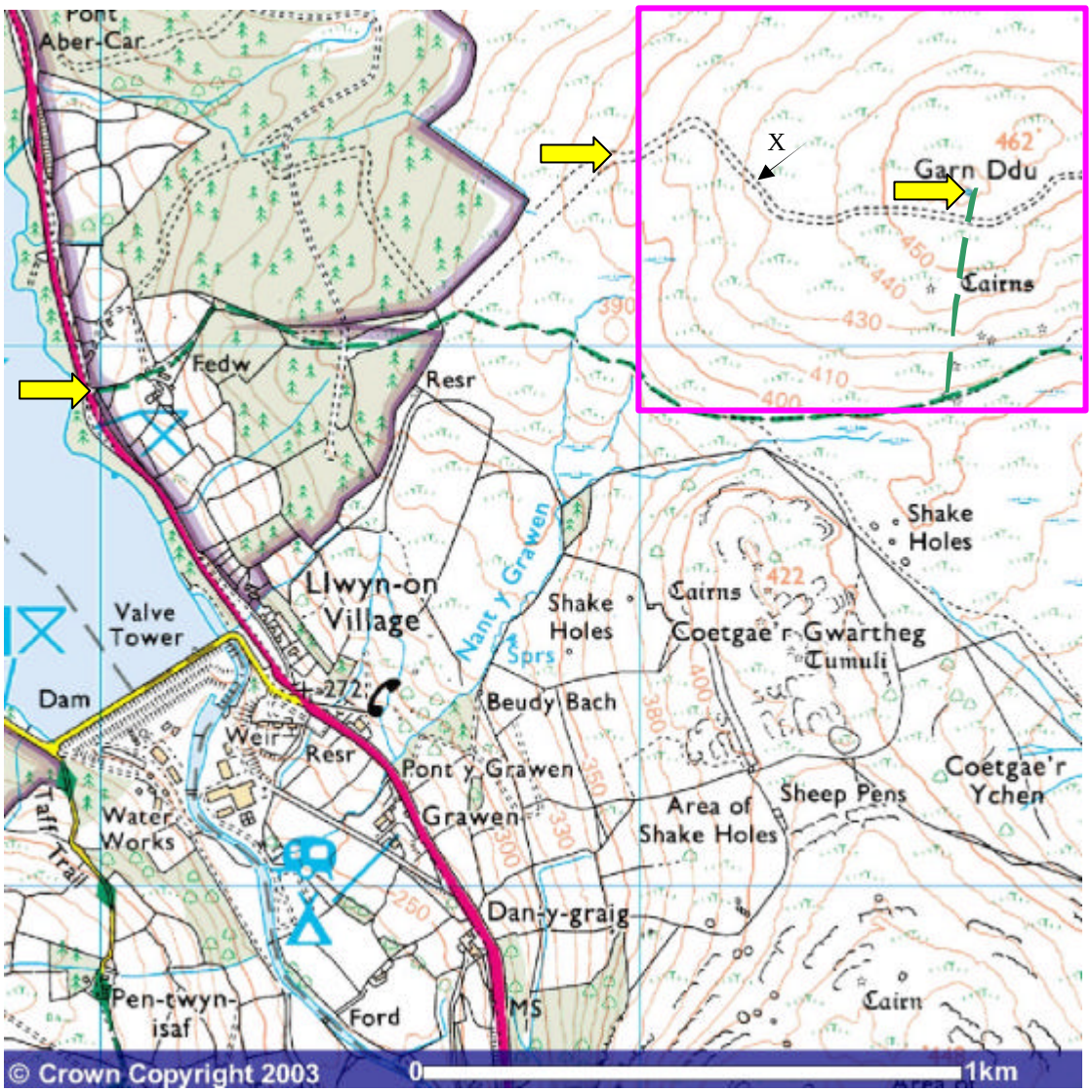
Route planning and contours



- **Contours show the height of land above sea level in metres**
- **Contours link places of equal height**
- **Contours which are close together reflect steep ground**
- **Features such as paths, rivers and roads which do not cross contour lines but follow them reflect very little variation in their height, i.e. on the level**
- **Not all contours have heights marked on them. You can use ones which are marked to work out the height of others. Adjacent contours are 10m apart. Contours every 50m are shown as thicker.**

Exercise 1

1. Lay a sheet of tracing paper over the map above, and trace out the route marked by the yellow arrows along the bridleway and the footpath, from the road to the summit of Garn Ddu. You may find it helpful to staple the tracing paper to the map to stop it moving.
2. Mark on your tracing each time your route crosses a contour line. Indicate the height of the contour on your tracing
3. Remove the tracing and using a ruler measure the distance in mm as the crow flies between each contour mark on the tracing. Don't forget to measure the distance from the start to the first contour and the last contour to the end of your route. Enter the measurements in the table provided. Use the scale provided to convert your distances into kilometres and enter in the table. Also calculate the cumulative distance from the start of your journey.

contour number	Height (metres)	Distance from last contour (mm)	Cumulative distance from start (mm)	Distance from last contour (Km)
start				
contour 2				
contour 3				
contour 4				
contour 5				
contour 6				
contour 7				
contour 8				
contour 9				
contour 10				
contour 11				
contour 12				
contour 13				
contour 14				
contour 15				
contour 16				
contour 17				
contour 18				
contour 19				
contour 20 - end				
Totals				

4. Using the mm square graph paper with the long side along the bottom, draw a pair of graph axes. Using the origin as the start of your route, mark on the x-axis your contour positions using the cumulative distances calculated in your table. So if the first contour is 8mm from the start then mark 8mm or 8 squares along the x-axis. Repeat for all contours
5. Work out from your table the lowest and highest contour your routes crosses. Using these values mark a suitable scale on the y-axis of your graph. The scale need not include heights below the lowest contour
6. For each contour mark a cross, above the appropriate mark on the x-axis, to show the height
7. Draw a smooth curve between all points on your graph

Questions

1. What was the total distance of your route? Why is this only an approximation?

2. What was the net height gained during your journey?

3. How could you use your route profile to better plan your journey time?

4. What appearance do contours which are close together give your profile?

5. The path at position marked X on the map shows the path following the contour line. What would this mean in real life?

6. Which part of your journey was the steepest?

Exercise 2

1. Lay a sheet of tracing paper over the area on the map bounded by the pink rectangle
2. Trace each of the contours. Also trace the top and right hand edges of the rectangle
3. Using drawing pins, pin the tracing onto the foam
4. Using the craft knife carefully cut out the contour with the greatest height. Cut along the purple rectangle linking the two ends of the contour
5. For each contour move the tracing to a new bit of foam and repeat step 4.
6. Stack the foam cutouts on top of each other to form a 3D model of the traced landscape, sticking each layer to the one below

Questions

1. Looking at your 3D model, how does the horizontal size of each step relate to the contours on the map and the steepness of the slope?

2. Using the map identify on your model the route you took to the summit. Was the route you took up the hill a steep one?. Was your route steeper than if you had taken the bridleway all the way and approached the summit of Garn Ddu from the south

3. Draw below what contours you would expect to see on a map for:

a) a valley
b) a hill in the middle of a flat area
c) a steep cliff on the coast