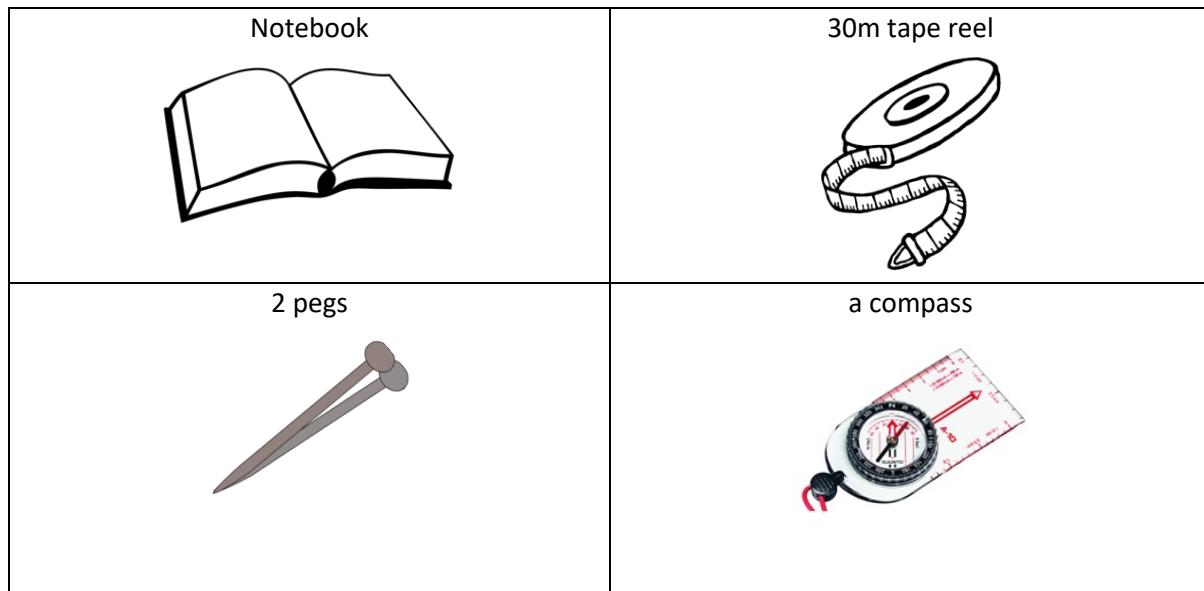


## Pacing survey

### Equipment:



### Preparation:

This can be done at any time.

- Split into groups with a minimum of 2 people. At this stage the groups need have nothing more than a single 30m tape and 2 pegs or 15cm nails.
- Move the group to a level piece of ground that allows them to lay out the tape flat and straight using the two nails/pegs to keep the tape flat and straight.
- Each member of the team, in turn, should pace / stride up the length of the tape counting the number of paces taken to cover the 30m stretch.
- Repeat these another 4 times logging the name and the number of steps taken each time.
- Each person's pace length should now be calculated based on the mean of the number of steps taken to cover each of the 5 \* 30m lengths
  - $5 \text{ lengths} * 30\text{m} = 150\text{m}$
  - $150\text{m} / \text{sum of the number of steps} = \text{pace length}$
- Once each person's pace length is established, move to the area to be surveyed.

## Now to the survey ...

- Establish where North is using the compass and chose a fixed a datum point<sup>1</sup>. It is from this point that this, and other surveys of features in the immediate area, will be carried out.
- Methodologically, while walking in a straight line, from the datum point to a point on or around the feature being surveyed counting the paces.
  - Sketch a line drawn from datum point to the point on the feature
  - note the number of paces and the name or the person
  - note the angle from north of the line by reading it off the compass

This can be sketched on a piece of graph paper which will be used later to draw the outline of the feature(s)

- Repeat this from point to point around the feature until you have sketched the feature in full noting the number of paces, the name and the angles
- The sketched image can then be transferred to notebooks or photographed for use later.

Note: It is helpful to take a photograph of the area being surveyed as well as a photograph of the finished sketch – that way when the image is processed later there will be an accurate representation. With the original datum point, you can repeat the process to measure other features in the area.

Below is an example of a group that carried out the pacing survey and their relative stride lengths

Pace-length calculations:

Name	Traverse 1	Traverse 2	Traverse 3	Traverse 4	Traverse 5	Mean (Total/5)	Calculated Stride length 30m/Mean	Number of Paces to cover 3m
Ian	36	37	37	37	37	184/5 = 37	.77m	3.9
Darren	33	33	33	33	32	164/5 = 33	.91m	5.88
Fern	38	39	39	39	39	194/5 = 39	.82m	3.66
Jake	32	33	34	32	32	163/5 = 33	.92m	3.26

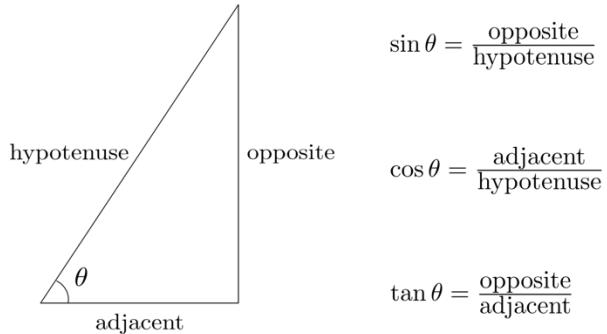
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<sup>1</sup> A Datum point is a fixed, recognisable point that you can return to if you have not finished. e.g. a concrete gatepost or a point on a tree stump

From this you can see how when **Ian** paces a distance, that

- it will take 3.9 steps to cover 3 metres, and
- if he takes, say,  $7\frac{1}{2}$  paces between one point and another, that he has covered 5.78 metres ( $7\frac{1}{2} * 0.77$ )

If there is a slope between two points then the same applies, only less distance will be covered. This can be estimated for most rough surveys ...or you could use trigonometry:



$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}$$

$$\cos \theta = \frac{\text{adjacent}}{\text{hypotenuse}}$$

$$\tan \theta = \frac{\text{opposite}}{\text{adjacent}}$$

$$\cos(a) = A / D \text{ so } D = A / \cos(a)$$

This is a useful chart for when you are setting out a grid to carry out a survey.

If your grid is in 1m squares, the diagonal of one of the squares is 1.41m; for 5m squares, the diagonal will be 7.07m, and so on.

Length	1	2	3	4	5	6	7	8	9	10	20	30
1	1.41	2.24	3.16	4.12	5.10	6.08	7.07	8.06	9.06	10.05	20.02	30.02
2	2.24	2.83	3.61	4.47	5.39	6.32	7.28	8.25	9.22	10.20	20.10	30.07
3	3.16	3.61	4.24	5.00	5.83	6.71	7.62	8.54	9.49	10.44	20.22	30.15
4	4.12	4.47	5.00	5.66	6.40	7.21	8.06	8.94	9.85	10.77	20.40	30.27
5	5.10	5.39	5.83	6.40	7.07	7.81	8.60	9.43	10.30	11.18	20.62	30.41
6	6.08	6.32	6.71	7.21	7.81	8.49	9.22	10.00	10.82	11.66	20.88	30.59
7	7.07	7.28	7.62	8.06	8.60	9.22	9.90	10.63	11.40	12.21	21.19	30.81
8	8.06	8.25	8.54	8.94	9.43	10.00	10.63	11.31	12.04	12.81	21.54	31.05
9	9.06	9.22	9.49	9.85	10.30	10.82	11.40	12.04	12.73	13.45	21.93	31.32
10	10.05	10.20	10.44	10.77	11.18	11.66	12.21	12.81	13.45	14.14	22.36	31.62
20	20.02	20.10	20.22	20.40	20.62	20.88	21.19	21.54	21.93	22.36	28.28	36.06
30	30.02	30.07	30.15	30.27	30.41	30.59	30.81	31.05	31.32	31.62	36.06	42.43