

**Orientation and Scale (Treasure Island Maps)**  
**Geology in the Field – EPSC 240**  
 Sept 25 2019

**Meet:** Meet at 1:35pm at the classroom (FDA 348) to walk together to grassy area.

**Bring:** Bound, hardcover field notebook, ruler, protractor. You will check out a Brunton Compass for the afternoon, and return it when you are done. Replacement value of a Brunton compass is currently \$397 CAD so do not lose or damage it! Make sure the TAs check your compass back in before you leave.

**Wear:** Comfortable clothes for hot weather, sun protection, forecast is hot and we'll be on grass.

**Instructions:** Today we will practice measuring strikes and dips on artificial outcrops and locating those outcrops relative to each other using pace and compass mapping.

1. Work with a partner - each person will turn in their own paper, but staying together and double-checking all measurements with your partner will help you verify your map before you start plotting.
2. Determine your pace
  - (a) Walk normally! along the measuring tape, recording your paces using a pace counter
  - (b) Walk uphill, downhill, and horizontally to see how your pace changes.
  - (c) Repeat measurements twice or three times, make sure your results are consistent
  - (d) Compare with your partner to establish the difference between you - do you both show similar variation with slope?
3. Practice sighting azimuth -
  - (a) Set up test azimuth - far and near - flagging tape on trees? flags in the ground
  - (b) Confirm accuracy of your sighting technique - if no match between partners, check that declination is correct on your compass
4. Collect data for treasure map -
  - (a) Using your pace to measure, and sighting with your compass, determine the distance and angle between two outcrops
  - (b) Repeat until all outcrops are located with respect to other outcrops
  - (c) Make a web of measurements so that each outcrop's location is determined by multiple measurements - this redundancy will help you if you find conflicts in the data when you are plotting.
  - (d) Work with your partner to double check your sightings and pacing as you go.
  - (e) At each outcrop, measure the strike and dip of the plane.

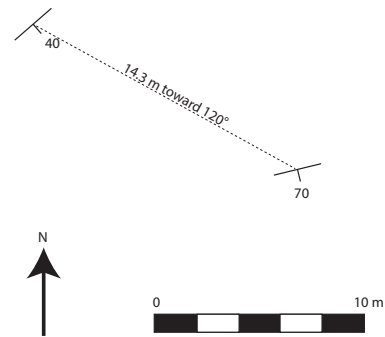


Figure 1: Example map: two outcrops plotted with distance and azimuth between them, north arrow and scale

5. Return your Brunton compass, make sure it is checked in by the TAs
6. Plot your map
  - (a) Determine the appropriate scale for your map to make sure you can fit all the outcrops on one page. Orient the north direction on the page.
  - (b) Starting in one corner of your area, plot an outcrop using the strike and dip symbol (as seen on geologic maps).
  - (c) Measure the distance (according to your scale) and the orientation (relative to your north arrow) to a second outcrop, and plot the strike and dip at that outcrop. Indicate the measured distance/orientation with a dashed line (see Figure 1).
  - (d) Continue until all outcrops are plotted.
  - (e) Plot your redundant measurements, until all measurements are plotted. DO NOT just draw lines connecting the outcrops, actually plot the measurements. Do not adjust or change your measurements. If they don't connect to the outcrops you've previously plotted (and some probably won't), just end the line where your measurement ends.
  - (f) Where you have gaps between the end of the lines and the location of the outcrop, measure the gaps. If they are greater than 5% of the length of the line which was measured, color the line red.
7. Turn in your map in class on Monday October 7