Determining the Limitations of Measurements with Silva, Brunton, and Mobile App Compasses

Description

The purpose of this lab is to document if there are limitations with the Silva, Brunton, and phone compass app(s) related to measuring strike and dip of joints on rocks. If team members have both android and Apple phones, it is recommended to see if the same limitations apply to both.

The students may want to use their phones in field applications, and this is to provide confidence as to whether they can expect reliable results. Prior to this lab, the students learned how to use Silva and Brunton compasses for measuring joint angles.

Inside Geology Building

While doing the measurements inside the building, remember that the geology building is constructed using materials processed from rock. Do the following activities:

- Perform a refresher on how to use the Silva and Brunton compasses by taking strike and dip measurements using the joint wall
- Takes strike and dip measurements using the Silva, Brunton and phone app(s) at the following locations and record measurements and observations:
    - Wall between the two doors into the rock mechanics laboratory
    - Metal stair railing to the sub-basement
    - At any 2 locations on main floor of geology building

Outside

Go outside and take strike and dip measurements of joints on 3 separate boulders located in the garden between the Gordon Oakes Centre and the Arts building. Use all 3 compasses.

- For each boulder, take a photograph. Describe the boulders colour, approximate dimensions, estimated weight using a density of 2.7 g/cm^3. Measure the GPS coordinates (latitude and longitude) with your phone. Do you think the boulder is sedimentary (limestone), igneous or metamorphic? Hint: Check out the University of Saskatchewan Geological Boulder Map of Campus to see if it is listed there or if there is a similar boulder there: https://artsandscience.usask.ca/geology/documents/boulder.pdf
- If you haven't done GPS coordinates, go to 1:45 of this video which how you just touch and hold the screen in Google Maps, then the coordinates are provided. Use the search function to find the full label such as (52°07'59"N, 106°37'44"): https://www.youtube.com/watch?v=yFavIeiWmO8

Write-up Regarding Lab Outcomes

In table form, provide the results of three joints measurements, each on a different rock

Rock #: Insert photo of rock showing compass on joint surface being measured			
Latitude/Longitude			
Rock Type			
Brunton Compass			
Strike		Dip	
Silva Compass			
Strike		Dip	
Phone	App Name:		
Strike		Dip	
Notes including rock type (sedimentary igneous, metamorphic and estimated weight (show calculation) :			

Assessment

Out of 13 marks, with 3 marks for each rock. For each rock, 1 mark each is assigned to reasonable strike/dip, reasonable weight, completed table. An additional 2 marks is assigned to answering each of these questions:

- Are there limitations with the compasses? If both android and Apple apps were used, is one type of app better than the other?
- How might this activity be useful if you are in the field doing measurements?