1. Look at the Snow Profile graph. What do you notice about the profile and how it changes in hardness?
   1. Do you see softer layers at the top and harder at the bottom, consistently through the snowpack?
   2. What might have caused soft layers within the snowpack?
   3. What might a soft layer below a harder layer mean for snow stability (avalanche)?
   4. What other things in the snowpack might indicate increased avalanche danger?
2. Plot the following hypothetical temperature gradient data onto your snow profile. Connect the points with a smoothly curving line.

|  |  |  |  |
| --- | --- | --- | --- |
| **Hypothetical snowpack temperature gradient data for March 7, 2019** | | | |
|  |  |  |  |
| Depth (cm) | Temperature (deg. C) |  |  |
| 0 | -8.5 |  |  |
| 10 | -4.0 |  |  |
| 20 | -3.0 |  |  |
| 30 | -3.0 |  |  |
| 40 | -3.0 |  |  |
| 50 | -3.0 |  |  |
| 60 | -2.0 |  |  |
| 70 | -1.5 |  |  |
| 80 | -1.5 |  |  |
| 90 | -1.5 |  |  |
| 100 | -1.0 |  |  |

1. Is temperature increasing or decreasing with depth?
2. Why do you think this is? (HInt: What would you expect the ground temperature to be? What was the air temperature like? How does this affect the temperature gradient of the snowpack?
3. How many degrees of change do you see over 100 cm?
4. As spring continues, what will happen to the air temperature?
5. What would you expect this to do to the snowpack?
6. How might the temperature gradient of the snowpack change?

Temperature gradient is how the temperature changes over distance in the snowpack.

* A change of more than 1 degree C in 10 cm is considered a strong temperature gradient.
* A change of less than 1 degree C in 10 cm is considered a weak temperature gradient.

1. Is the temperature gradient here strong or weak?

Why do temp gradients matter?

1. Strong temp gradient moves vapor faster through snowpack, weak temp moves water slower
2. Faster water vapor = layer instability
3. Slower water vapor = layer bonding/stability
4. Would you expect the snowpack on this date to be stable or unstable? Explain your answer.