

2020 Moon to Mars Ice & Prospecting Challenge

PROSPECTING/DIGITAL CORE FORM



University: _____

System Name: _____

DIGITAL CORE
(Teams fill out the section below)

1. How many layers does your test bed contain (including the ice)? _____
2. Using the chart below, estimate the depth of each layer in centimeters.

Graphical Depiction of Test Bed (Not to scale)

Layer	Depth.
Layer A = _____	_____ cm
Layer B = _____	_____ cm
Layer C = _____	_____ cm
Layer D = _____	_____ cm
Layer E = _____	_____ cm
Layer F = _____	_____ cm
Layer G = _____	_____ cm
Layer H = _____	_____ cm
Layer I = _____	_____ cm



3. Sequence the layers in order from softest to hardest by filling in the boxes below:



Scoring for identifying the correct number of overburden layers and determining relative layer hardness (Max 50 points)

- Partial points will be awarded if teams can correctly identify some of the correct spots for the layer's sequence.
- For each layer greater than or less than the current number of layers, teams will lose 50/N points (where N is the true number of layers). Each layer will be compared with the correct layer sequencing to determine accuracy of the team's suggested order. An error term will be calculated based on how far off the team's remaining ordering is from the true ordering (based on the square of the difference between team's suggested ordering and the correct ordering), and remaining points will be scaled based on how large the error term is.

$$Error = \sum_{i=1}^N (Correct\ Layer\ Order_i - Your\ Layer\ Order_i)^2$$

$$Points\ Deducted = \frac{Error}{Max\ Possible\ Error} * Remaining\ Points$$

Scoring for identifying the thickness of each layer (Max 40 points)

- Partial points will be awarded for estimates slightly outside the MOE
- The suggested thickness of each layer will be compared to the actual thickness of that layer.
 - If the estimate is within the MOE for that layer, teams will receive 40/N points (where N is the true number of layers).
 - If the estimate is within 2 * MOE for that layer, teams will receive 40/(2N) points (half-credit).
 - If the estimates is greater than 2 * MOE for that layer, zero points will be given for estimating the thickness of that layer.
- This process will continue until the judges have checked all estimates against the true number of layers, regardless of whether the team estimated fewer or more layers (i.e., if there are 6 layers but a team only estimates thicknesses for 4, their estimate for the thicknesses of layers 5 and 6 will be treated as 0 cm, and no points will be awarded for estimating the thickness of unidentified layers).