

## Materials and Instruments Sheet

Object	Category	Year of expected purchase	Estimated Cost
Publication Allocations	Commission	All	\$10,000
<b>Total of Commissions</b>	Commission	All	\$10,000
Heat Shield	Hardware	2	\$400,000
Battery Pack	Hardware	2	\$30
Pan-Tilt Camera Servos 3x	Hardware	2	\$60
Multi-camera module	Hardware	2	\$70
Batteries 3x	Hardware	2	\$90
Solar Panels	Hardware	2	\$300,000
Rover	Hardware	2	\$1,500,000
<b>Total of Hardware</b>	Hardware	2	\$2,200,250
Ribbon Cable 3x	Materials	2	\$30
Heat-sink	Materials	2	\$2
Air bags	Materials	2	\$500,000
Aluminum Honeycomb Supports	Materials	2	\$270
Zylon (480m)	Materials	2	\$348
Ammonium Perchlorate	Materials	2	\$94
Powdered Aluminum	Materials	2	\$100
Kevlar	Materials	2	\$242
<b>Total of Materials</b>	Materials	2	\$501,086
Arducam 3x	Payload	2	\$90
Mini Ground Penetrating Radar	Payload	2	\$25,000
APXS	Payload	2	\$2,800,000
<b>Total of Payload</b>	Payload	2	\$3,326,176
<b>Total</b>			<b>\$5,536,426</b>

## Sources

Mini Ground Penetrating Radar	<a href="http://www.usradar.com/ground-penetrating-radar-cost/">http://www.usradar.com/ground-penetrating-radar-cost/</a>	A regular GPR costs about \$14,000. We figured factoring in the cost of commission and inflation, it'd be roughly \$25,000
Alpha Proton X-ray Spectrometer	<a href="https://www.cbc.ca/news/technology/mars-bound-rock-analyzer-a-new-step-for-canada-in-space-1.1007601">https://www.cbc.ca/news/technology/mars-bound-rock-analyzer-a-new-step-for-canada-in-space-1.1007601</a>	The listed total here is \$17.8 million. The team assumed the bulk of this figure was development, so \$15 million was knocked off.
Solar Panels		
Air bags	<a href="https://www.nasa.gov/centers/glenn/about/history/marspbag.html">https://www.nasa.gov/centers/glenn/about/history/marspbag.html</a>	This article states the pathfinder airbags cost \$4 million to develop. The team assumes that an extremely small version of them should be significantly less.