***First problem statement***

*NASA wishes to 3D print radiation shelters on Mars. Some of the regolith has been identified as suitable for 3D printing. NASA requires a prototype rover system to collect the resource and bring it to the collection area. The range of the system is over a 3m^2 area with an upper bound of 3m in the x and y directions. The rate of resource collection should be a great as possible. The rate of collection will be measured in kg/ 240 sec period. The system should be suitable for transport and operation in the Martian environment. It should consume as little power as possible.*

***Revised problem statement***

*As part of their assessment for a first-year engineering programme students are required to produce a working prototype of a rover. The rover must be built by the students in ten weeks. It must be able to move about on a Mars like surface (simulated by beach terrain with small rocks, sandhills and recesses) and collect resources (simulated by small pebbles/gravel). The ‘Mars-like’ area is approximately 9 m^2 and the rover will be required to operate continuously for 4 minutes.*

*The project will be marked on performance against five objectives. Four are objectively measurable. (in order of precedence)*

1. *Produce a rover. Binary Y/N*
2. *The rover is able to move about on a ‘Mars like surface’ and collect resources in the ten-week time period. Binary Y/N*
3. *A high rate of collection. Non-binary but measurable in kg per second.*
4. *Energy consumption – non-binary and measurable as mAh consumed.*
5. *Innovation - non-binary and subjective but related to execution of 1 – 4.*