**Land base on Mars – power generation**

**A supply of electricity for key equipment is essential at all times. The normal operation of a base requires a greater supply.**

What are some ways in which electricity can be generated or stored on the surface of Mars.?

1.

2.

3.

What are the constraints on the best possible version of each?

Cost

Output

Maintenance

Reliability

Earth-Mars transport

Accounting for the constraints, what is the most appropriate electricity supply system for the base?

How should the electricity supply be managed to ensure constant electricity for key equipment?

Maintenance

Location

Distribution

Control

Back-up

Security

**Land base on Mars – food production**

**A secure food supply is essential as a journey to or from Earth takes about seven months.**

What should be the balance between transporting food from Earth and producing food on Mars?

What are some issues for producing food on Mars that will need to be overcome?

Cost

Output

Reliability

Impurities

Water

Nutrients

How can each of these be overcome?

How should the food supply be managed to meet the needs of the base and to minimise cost?

Earth-Mars transport

Back-up store

Variety

Nutrition

Water supply

Fertilisation

Control

Security

**Land base on Mars – oxygen generation**

**An oxygen supply that cannot be interrupted is essential at all times.**

What are some different ways in which oxygen can be generated?

1.

2.

3.

What are the requirements of each system?

Accounting for the constraints, what is the most appropriate oxygen supply system for the base?

Output

Maintenance

Reliability

Spare parts

Earth-Mars transport

How should the oxygen supply be managed to ensure sufficient oxygen at all times?

Maintenance

Location

Distribution

Control

Back-up

Security

**Land base on Mars – layout and social organisation**

**The physical layout and social organisation of the base need to ensure the wellbeing of everyone, and to allow each individual freedom to flourish.**

How could the layout of a base be arranged to support wellbeing and individual freedom?

1.

2.

3.

What are some benefits gained with each of these layouts?

Social cohesion

Personal space

Privacy

Security

Autonomy

Well-being

What are some drawbacks with each of these layouts?

What is the best layout for a base on Mars, and why?

Social cohesion

Functionality

Security

Control

Well-being

Freedom

**Land base on Mars – Governance and jurisdiction**

**In the isolation of space, the base needs to be run in a way that ensures the wellbeing of everyone, and to allow each individual freedom to flourish.**

What systems could ensure a well ordered and effective operation of the base?

1.

2.

3.

What are some benefits of each system?

Social cohesion

Personal space

Privacy

Security

Autonomy

Well-being

What are some drawbacks of each system?

What is the best system of governance and jurisdiction for a base on Mars, and why?

Social cohesion

Functionality

Security

Control

Well-being

Freedom