



# PROBLEMS HUMANS WOULD FACE ON MARS



## 1. Over Heating by the Sun

- Radiation is dangerous - it damages the cells in our bodies, causing severe illness + even death in some extreme cases.
- On Earth we are protected by our own magnetic field but in space astronauts are vulnerable

## 2. Heavy Equipment

- To take a space flight astronauts need to take everything that they could possibly need with them to survive in Space - they can't take multiple trips back and forth
- The more food, luggage and machines they take with them the more fuel/force they will need to overcome Earth's gravity
- This means that NASA and other space agencies have to be very smart about what gets packed onto a rocket, they limit it down to the bare necessities needed and it's a good idea to have multiple uses for just one thing.

## 3. It is expensive!

- It costs a lot of money to travel to space for this I want you to either create an idea for a fundraising activity or write a list of the benefits of going to mars.

## 4. The temperature on Mars varies.... a lot!

- At night it can be  $-60^{\circ}\text{C}$  but during the day it can be  $20^{\circ}\text{C}$
- During the winter it can even get as cold as  $-125^{\circ}\text{C}$

## 5. The problem of isolation

- The distance between Mars and Earth is constantly changing (this is due to how Mars and Earth are in orbit - move around each other)
- The smallest recorded distance was 56 million km in August 2003. The largest distance earth and mars can be apart is 401 million km when they are on opposite sides of the sun
- As you can tell this is a long way to travel and on average it would take 7 months to even travel to Mars not including the months astronauts would spend on a Mars base. Staying in a small spaceship and a confined base on Mars means that you can't leave whenever you want to go back home.



# SOLUTIONS FOR THE PROBLEMS ON MARS



## 1. Over Heating by the Sun

First we think of what materials/conditions can be used to block or stop large amounts of radiation from entering the base.

- One material that is good at this is **lead BUT** it is a **heavy** metal **SO** it's not great for transportation especially to space
- **Water** is another example of something good at blocking radiation - could you possibly use this in the walls of the base and recycle the water as drinking water?
- Being shielded - using very **thick** walls is a very good idea when trying to block radiation - for example 5 meters of soil will provide the same protection as Earth's atmosphere
- The walls of the mars base could be made up of **many different layers of protection.**

## 2. Heavy Equipment

- For this it is a good idea to think about what could be recycled: for example water
- Try to think of as many things to be recycled as possible when designing the base
- When designing the base think of materials that are possibly too heavy to transport i.e. Lead

## 3. It is expensive!

- Just a space suit can cost \$250,000,000 - that is a lot of money
- You also have to get to mars - this will cost about \$6,000,000,000,000
- Then you have to set up your base - everything you need will cost money

## 4. The temperature on Mars varies.... a lot!

- Underground base
- Make sure that your base has very good heating
- Heating - use solar panels to generate electricity to Supply an electric boiler
- Could you pump water round the base to try keep it cool?
- 

## 5. The problem of isolation

- ★ Ways to overcome this is to carefully select who would go on this mission to mars. Pick people who are more likely to get on with each other.
- What trust exercises could the astronauts do to bond with each other?
- Also you could set up ways for the astronauts to de-stress or relax- Think about what makes you happy and helps you relax - could it be watching netflix, reading a book, doing a jigsaw, calling a member of your family or friend, playing minecraft? Make sure to have a place for this on the Mars Base.