

# Lunar Moon Base



Room 22  
Everglade Primary  
New Zealand

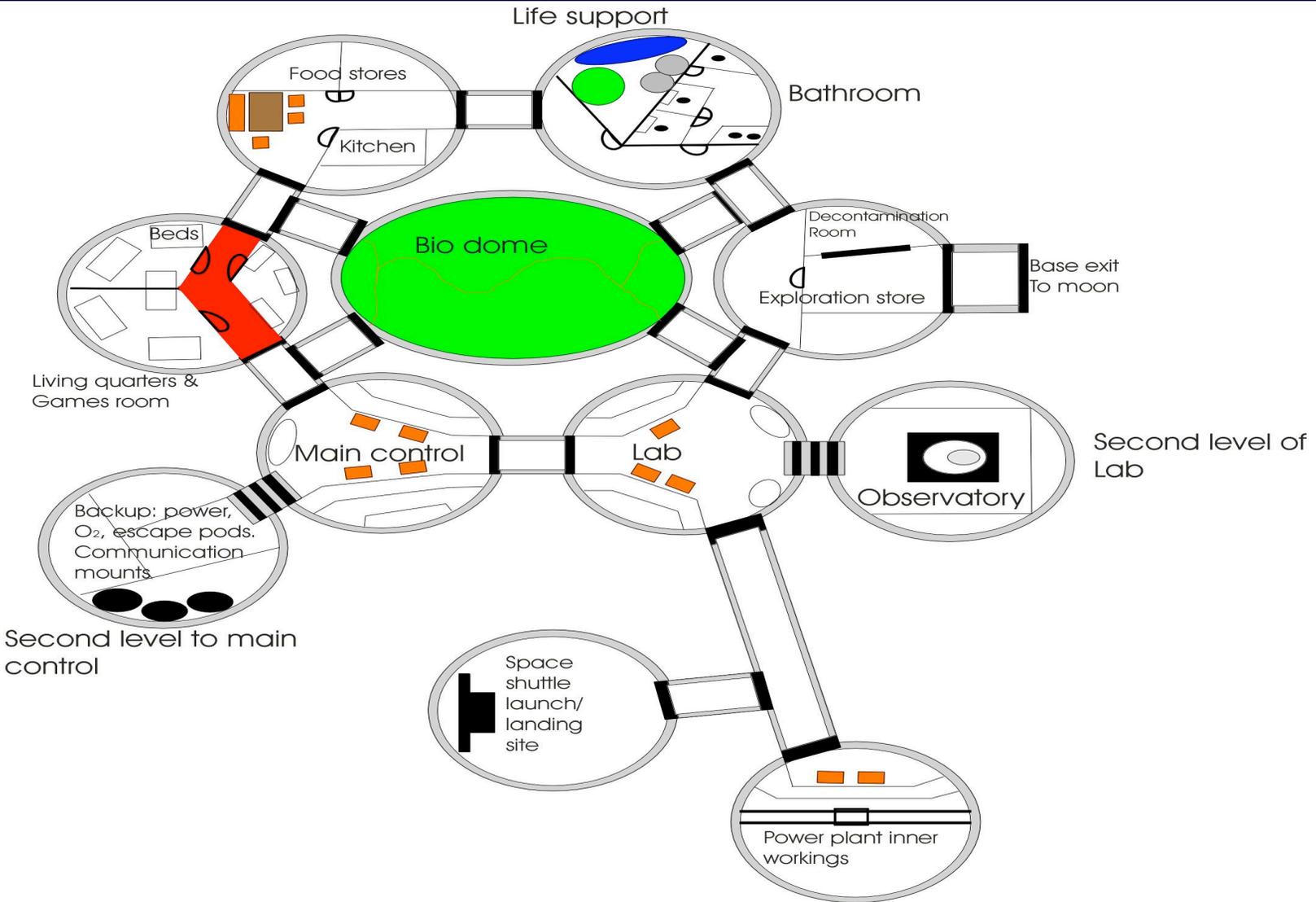
# Introduction

Room 22 of Everglade Primary School made an analogy of a Lunar Base. We are making it to help N.A.S.A. and to help our study of space.

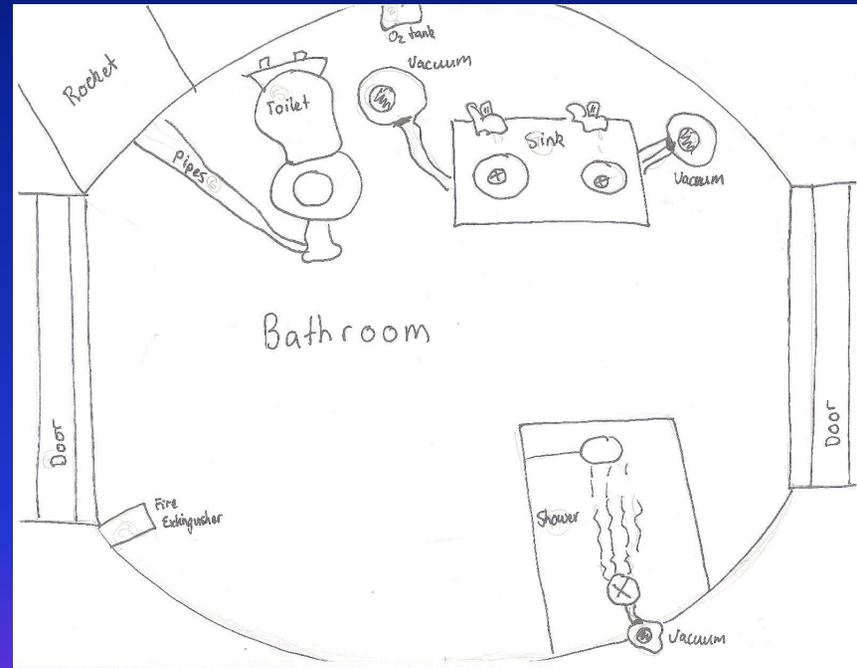
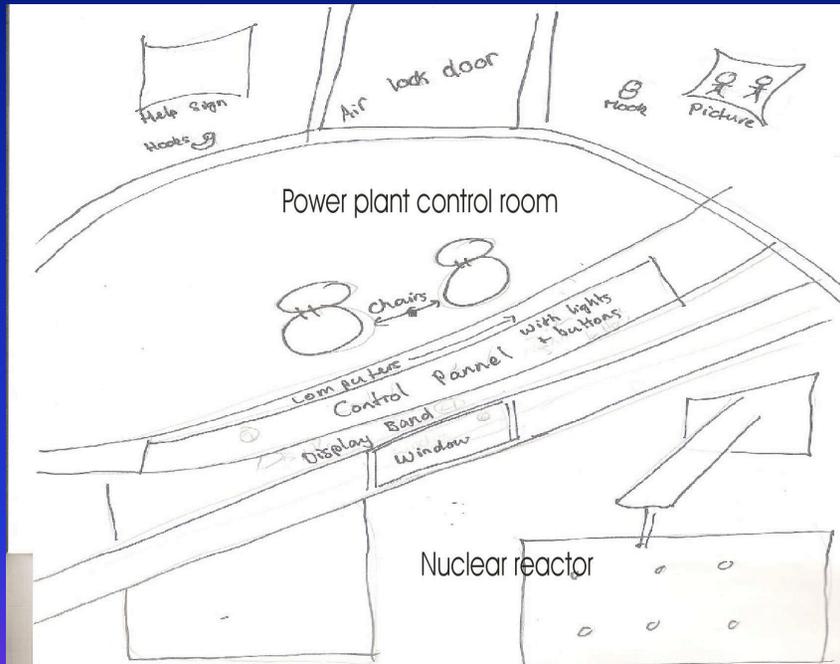
To build our Lunar Base we need to research a number of areas: life support, protection, recreation and communication, architecture and materials, research, exploration, waste, energy and contamination.

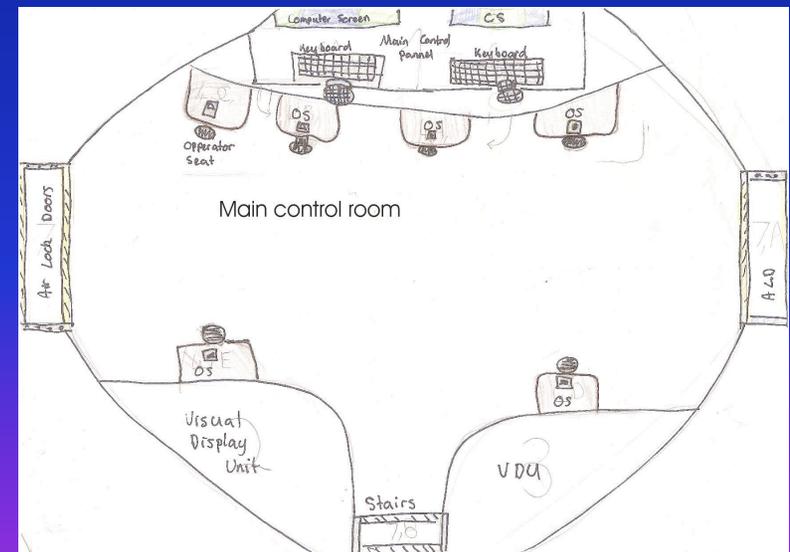
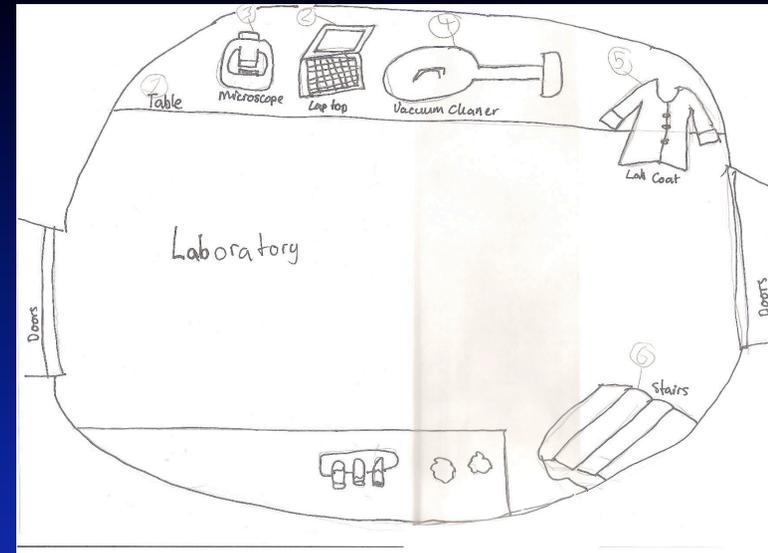
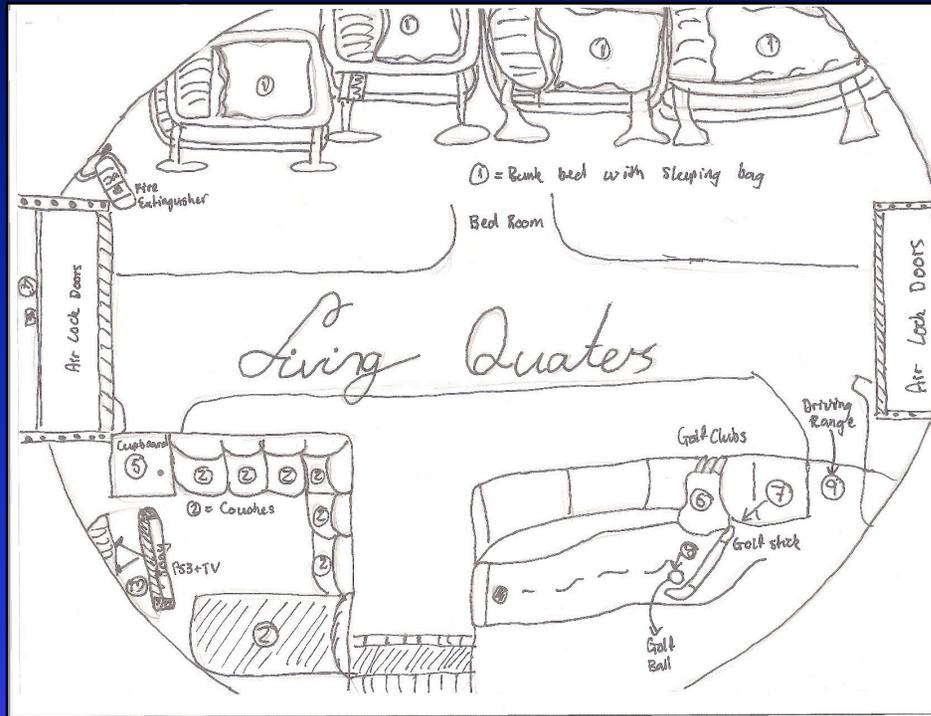


# Floor Plan



# Floor Plans





# Architecture



The next slides will be telling you about the materials, design, and location of our Lunar Base.

# Materials

Our Lunar base will be made out of titanium. Although titanium costs a lot and it can melt, we have found a way to protect it. That is why we are going to have a system of when it gets hot outside we will open a vent to let air out to make the titanium cold.

We have the same system inside but when it gets to cold inside we will let hot air in.

We can get both the systems working at once.

# Location

We need a location on the moon, in the paragraph below we will tell where and why we are putting it at that specific location.

The location for the Lunar base that we have chose is the **NORTH POLE**. It is known as a fact that if a meteorite hits the moon's surface there is less chance of a meteorite hitting the north or south pole. The poles also have more daylight hours to help keep temperature more constant.

We may also build our Lunar base underground for the same fact. Also underground means we are shielded from radiation. To build underground we would use a crater

If a meteorite does hit the moon on the North or the South Pole we will be safe.



Photos from NASA

# Design

The shape of our Lunar base will be a hemisphere, because it is easy to make a big hemisphere shape.

The hemisphere will be made out of hexagons joined together.

The shape is quite large as the research groups need quite a large space. They need lots of space to float around so they don't hurt themselves on the things around the room.

Our Lunar Base has many parts to it. We have tunnels attached to each hemisphere. We have about 8 to 9 hemispheres. There is a different hemisphere for each part of the base.



**Super plastic and metal used as Shield**



**Hexagon shape which our base is made out of**



Energy

# Power plant

The power plant in the station will link all the other stations and rooms.

The power plant will give the Lunar base energy for their moon buggies, TV's, computers etc.



# Power Plant Cont.

We have a computer to keep all the energy stable. The computer will do that by controlling all the rooms' energy and seeing how much they use a day, and seeing how much they need a day. The computer also controls the battery and the power plant.

The energy station also has a power plant that sends all the energy around the Lunar base, and will be controlled by the really huge computer. The computer keeps the power plant stable.



# Giant battery

The last important thing is the giant battery that is for emergencies like power cuts or short supply of power.

The battery holds about 500.62 volts of power for the whole Lunar base.

If the battery runs out we will have to evacuate everybody into one room so we don't have to waste all the power in every single room, instead we can just use power in one room.



# Wires

The Lunar base will receive power by wires that connect the power plant to the rest of the Lunar Base.

The wires will send about 200 volts a second.

If an area needs more power they will have to call us and tell us to give them more power. Then we will program the power plant to send more power to that certain area.



# Waste



# Grey water

We will deal with grey water by giving it to the waste plant. This is in the bio dome.

Grey water can be recycled by passing it through the bio dome. This means it can be turned into clean water. Grey water is bad for humans.

There will be a pipe with holes in it running through the dome that will be used like a sprinkler. We've chosen that plan because it's effective.

# Typical rubbish

For our Lunar Base we have made a trash compacter. The astronauts can throw the rubbish in the trash compacter, or you can press the blue button to mince the rubbish suitable to use it for the plants.

If you wish to make something such as paper art you may press the purple button. Soon you can start making something from the paper that you made from the trash compacter.

If you wish to not do those things then just press the red button.



# Sewerage

We will get rid of the sewerage just by burning it and then putting it in plastic bags.

We are also going to feed some of the sewerage through pipes to the bio dome and life support team to feed their plants. The plants will destroy any bacteria in the waste.

# The Bio Dome

We built a bio dome for plants to grow in space. The bio dome will be transported to the moon. We built a model out of newspapers of course the real dome will be built out of metal or titanium.

A tree gives us oxygen so we can stay alive. It gives us clean and fresh air to inhale, and it's always peaceful to be around them. The things that could go wrong are that the trees may not get enough water, food, sunlight or the right temperature. Just in case this happens we will need to use artificial light and warmth, carry extra soil, water and sewerage.



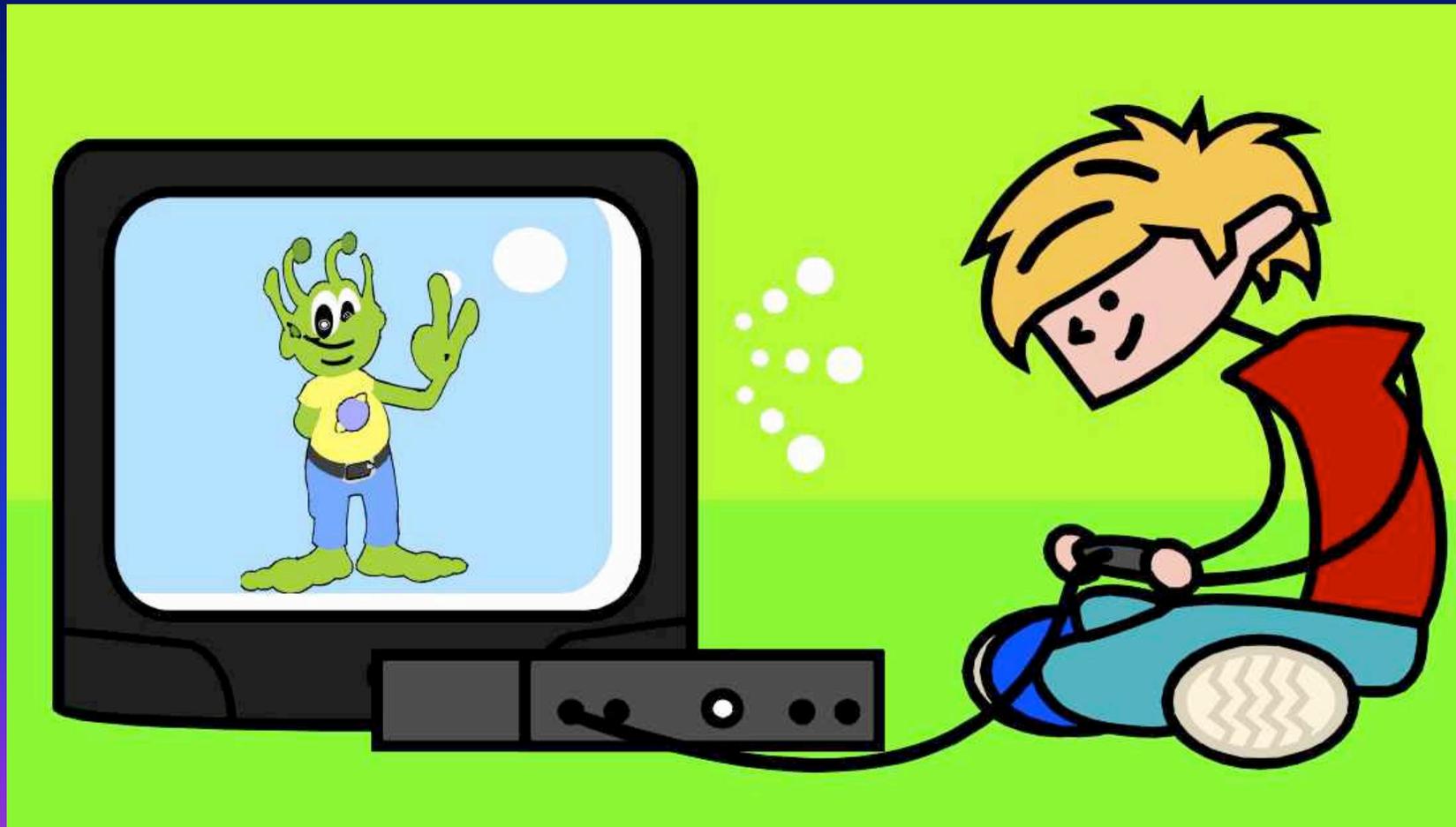
# Carbon Dioxide

We will get rid of CO<sub>2</sub> by giving it to the plants so they can make use of it.

I have chosen this idea because it works well.

For example the plants take in CO<sub>2</sub> and give off O<sub>2</sub>. We will do this by removing CO<sub>2</sub> from the rooms and pumping it into the bio dome.

# Recreation

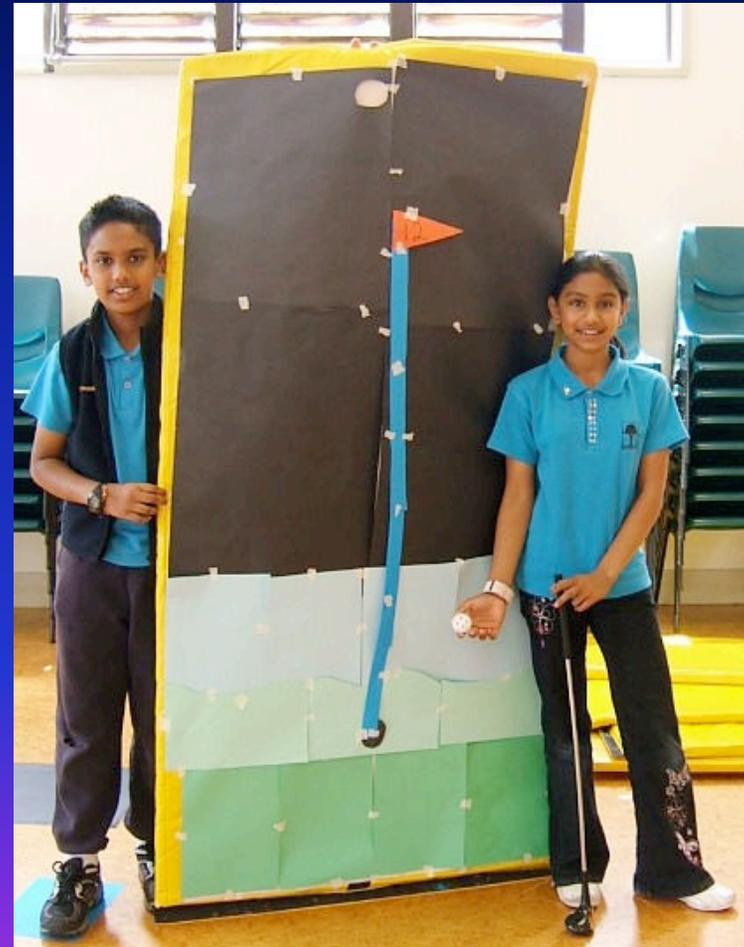


# Gaming Room

In our part of the base we will have a gaming room. The gaming room will be used for the astronauts to keep them company.

Recreation is important on the Lunar base because even astronauts need exercise and somewhere to relax.

The astronauts will also need a quiet room. They need to have some time to them selves. If they were really busy that day and they wanted to have a time out they will need a quiet room. (SHH)



# Gaming Equipment

We decided to have a portable DVD Player, a Play station 3, a P.S.P, an MP3 player, and a television in our games room.

We choose these items because when the astronauts become tired after a long hard day of work they need to have some time to themselves. This allows them to relax and unwind from their busy hurried schedules

We chose some portable equipment as it can be used anywhere anytime.



# Fitness

We need exercise machines on the moon because we need to stay fit and strong.

We also need to have a gym on our Lunar base to stay fit and strong.



# Living Quarters



# Rooms

- Bathroom:
  - So people can have a wash down.
- Toilets:
  - We need toilets because we need to do business
- Two fold beds:
  - So people can go to sleep or have a nap.
- Little kitchen :
  - If people get hungry or want to have a drink they need a little kitchen.



# Beds

In the Lunar Base the astronauts will sleep on a camping style bunk beds. The will be made out of lightweight metal and plastic.

We will have some beds so astronauts can relax.

The astronauts will have beds so they can relax. While they relax they will be able to watch T.V or some videos so they won't get bored.

For example: When the astronauts are tired they can relax on the beds and watch T.V.



# Bathroom

Astronauts need to have a shower to keep clean.

We have to have roof so the water won't go everywhere. We have curtains for the same thing

The toilet has a pipe to go to the bio dome, when we do our business and flush it will go through the pipe to there.

The sink is the same as the toilet.

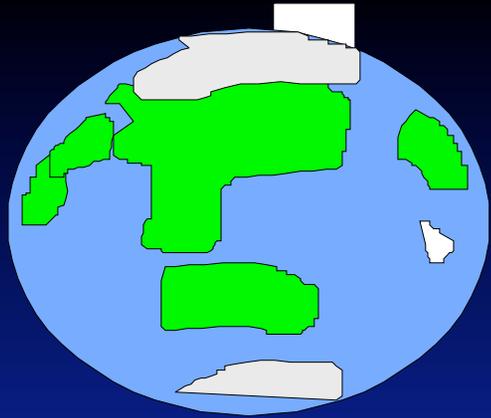


# Changing Machine

When you are in Space there is no gravity. In a rocket there is also no gravity, but on the Moon there is only some gravity.

If you are going to change into your space-suits you need to have something which stops the moon dust coming in and contaminating your indoor clothes. You will also need a changing machine that changes for you.

When you go in it with your normal clothes on, you would be changed. You won't need to have any wires or batteries because it's automatic. All you have to do is store your space-suit in the closet and walk in through the first door that says IN and you would be already changed when you come out of a door that says OUT on the other end. It would have another closet for your normal clothes or spare clothes.



# Communication



# To communicate I would use...

- Push to talk button.
- Walkie talkie.
- 60 foot radio antenna.
- Computers.
- Video feed.

## Our Antenna



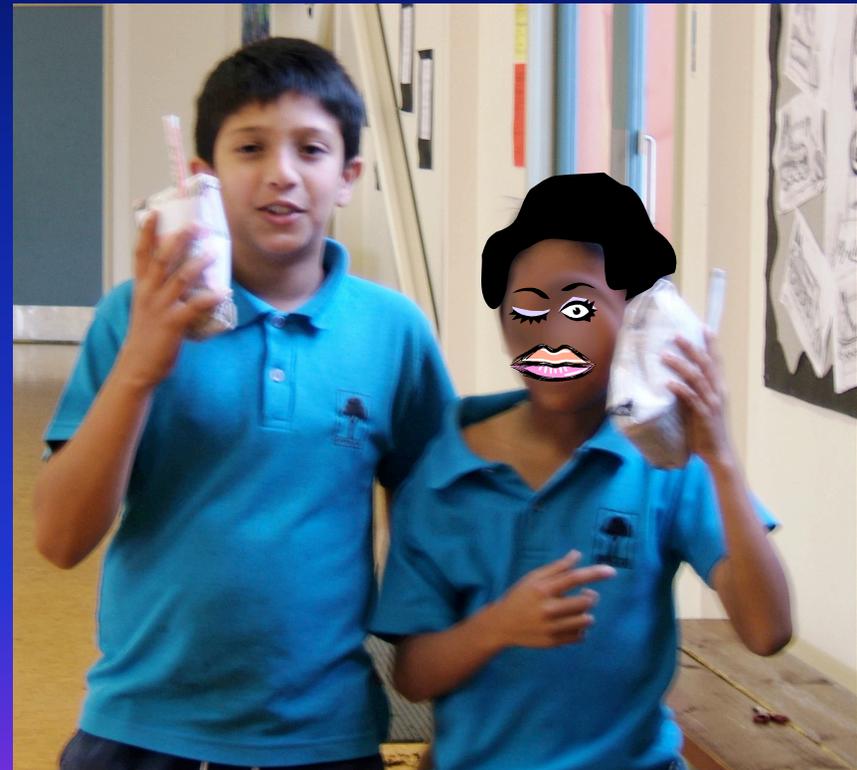
In our part of the base we will need communication so we can communicate to people on earth. We will need a 60 foot radio antenna to communicate to earth.



# Walkie Talkies

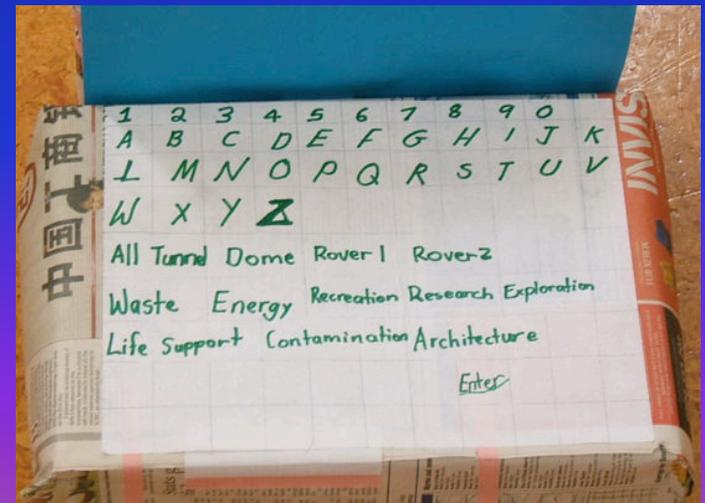
We need walkie talkies on our Lunar base because if the astronauts are in trouble we can get to the people working on this mission to help the astronauts.

The walkie talkies will let us communicate with the people on or around the moon and the people on earth working on this mission.



# Control Panel

We need a control panel on the moon because we need to get in contact with the people on and around the base. So we can find out if people are safe around the base. We also need to get in contact with the people on earth working this mission.



# Laboratory



# Equipment

We have chosen 4 piece of equipment they are ... microscope, Vacuum cleaner, computer and moon buggy.

Microscope – when we get samples we can look at them really close with the microscope. The microscope makes things look very big, so we can study small objects from the moon.



# Laptop

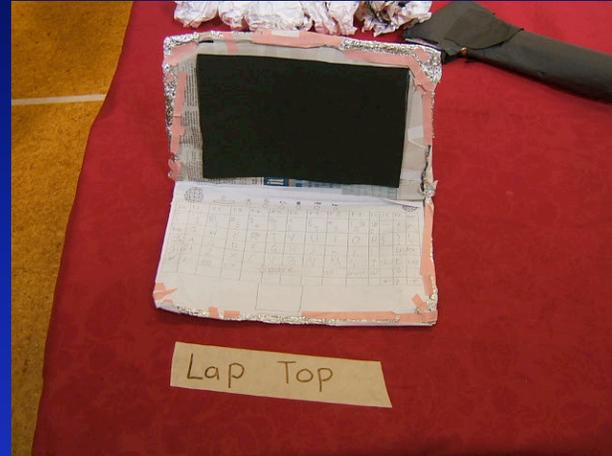
I made Laptop for our Lunar base. We need the Laptop to research and find information. It will also help us to communicate to other people.

This Laptop is wireless so we can take it anywhere. This will be in the laboratory.

We have a web-cam on the top of the screen so we can web-cam back to the people on Earth.

Programs installed will be MSN internet, and programs to store gathered information about the moon.

Computers are really important for research. After looking at samples we can write this information into the comp



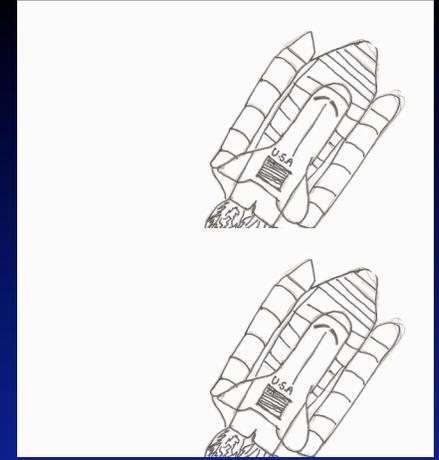
# Vacuum Cleaner

The vacuum cleaner is used to suck the dirt and dust. The objects found on the moon need to be cleaned before we can study them.

The dust buster could be better because it is smaller and easier to use.

Our vacuum cleaner is wireless so we can take it any where.





# Exploration

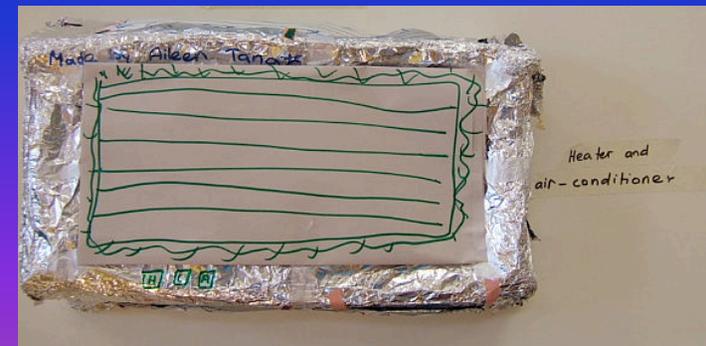


# Heating and Air Conditioning

The heater and air conditioner is combined in one device. There will be an automatic button so you won't have to keep and pressing the H button and C button. The automatic button will have an A on it. The H stands for heater and the C stands for air conditioner. They are for when the automatic button doesn't work.

For the people in the base it can get very hot or cold. So to keep people the right temperature we can put these units in several parts of the base. These are all controlled by one switch

You won't need to have any wires or batteries because you just need to have the sensor.



# Space Suit

On the space suit there will be a helmet and there will be something on the helmet. On the helmet is a visor.

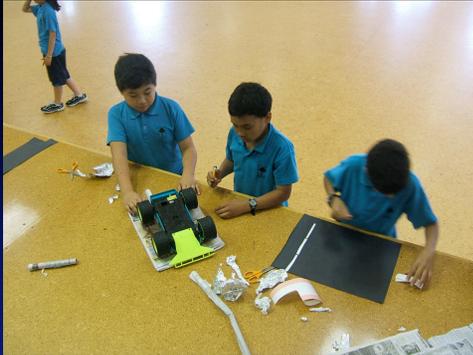
The visor protects your eyes from the sun so you wont get blind.

Another feature is a water cooling tube. The water cooling tube helps you not to get hot in the space suit.

On the boots it is going to magnetic. The boots are magnetic because you can walk properly when you are in the Lunar base.



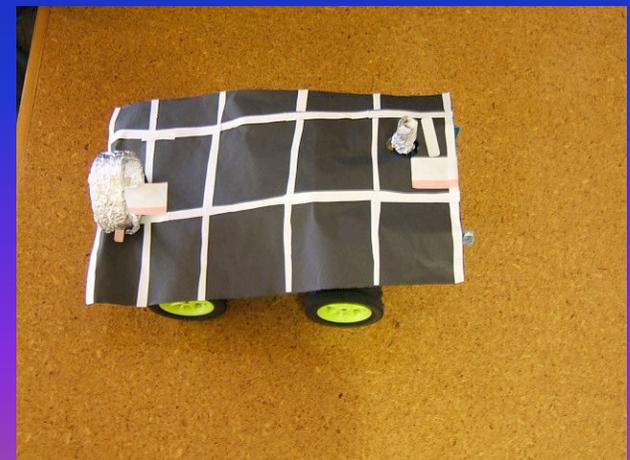
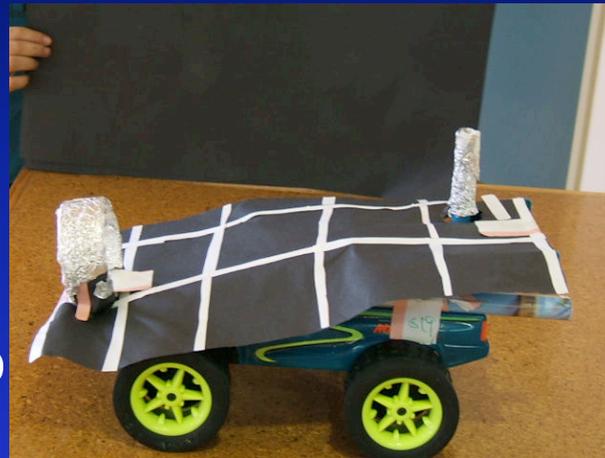
# Moon Rover



The moon buggy is used to drive around with a camera which is linked to a TV inside the lab.

The moon buggy can also get small objects from on the moon and bring them back to the lab.

The moon buggy is used to travel around the moon faster and quicker.



# Air-Lock Doors

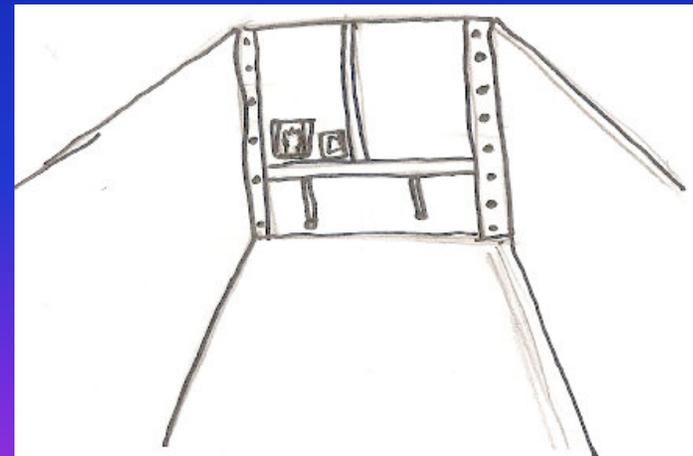
We need air-lock doors to save oxygen, and for trapping air so we can still live.

The air-lock doors have a button to activate the doors. They also have a handprint to lock them.

A submarine has air-lock doors to trap in all the air.

Air-lock doors open one set of doors while the other remains closed.

Air lock doors are built with know holes in them. They are made out of thick solid metal.



# Fire Extinguishers

We need some fire extinguishers in our Lunar Base because if there was a fire we would need something to put it out with.

There are three types of fire extinguisher the powder type, water type, and also the CO<sub>2</sub> fire extinguisher .

We can't use the power type because the powder would go everywhere and cause havoc.

We can't use the water type because we will get wet and the water will go inside the electrical devices.

We need to use the CO<sub>2</sub> fire extinguisher. With the CO<sub>2</sub> fire extinguisher we have to be careful, and make sure that all the filters are working and the airlock doors are working too.



# Telescope

When we are in space we need to look out for danger in case of asteroid rocks that may bump into us.

It has two glasses one on each end of the telescope. If you look on the small glass you can see closer because on the other side the telescope it has a bigger glass which will help you see bigger.

The telescope is like a magnifying glass, because it also help you see closer, however a magnifying glass only as one glass.

# Decontamination Shower

The decontamination shower is used for washing those space suits and sometimes it can wash you.

We are making the decontamination shower because it makes your things clean. The decontamination shower gets its water from the waste group.

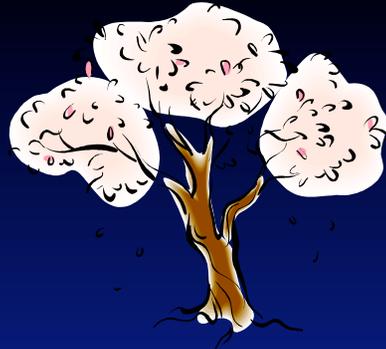
The material we are going to use are, titanium metal, hard plastic and thick glass.

The decontamination shower will be part of the exploration group. The shower will have a switch to turn it on.

We will also try and build a sink, however we may not have a good water supply. So have to have a quick shower. Power is another of our concerns.

We also need the shower because when you come in from the moon you might have moon dust and it could get into your lungs if you breathed it in.

CO<sub>2</sub>

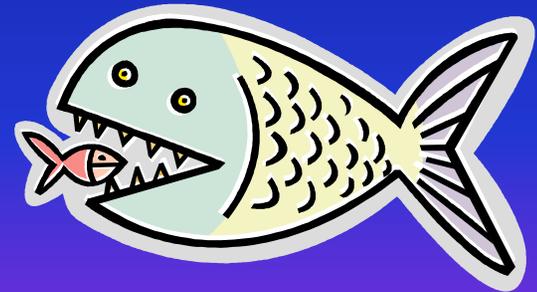


H<sub>2</sub>O

# Life Support



O<sub>2</sub>



# How much oxygen does a person need?

A person breathes 11 thousand litres of air per day. Air is about 20% O<sub>2</sub> and when we breathe out there is still 15% O<sub>2</sub> unused. Therefore a human being uses about 550L of pure oxygen per day. Exercising will use more O<sub>2</sub>.

For the astronauts to insure the air stays a round 20% O<sub>2</sub> mix. Oxygen senses and Carbon Dioxide senses will be needed in every room/ area of the base. Air will also need to be circulate by fans because if we don't get the air circulated we wont have enough oxygen for us to live on the moon and we would all die.

# How we are going to get the O<sub>2</sub>?

We need Plankton to make oxygen for the base or everyone in the base will die.

The plankton will pump out the O<sub>2</sub> and a pipe will come out and suck up the O<sub>2</sub>. It will go through the air vent to all the rooms in the base. There is also going to be a sensor to make sure that the room doesn't have too much O<sub>2</sub>/CO<sub>2</sub> or not enough O<sub>2</sub>/CO<sub>2</sub>. We are also going to have a big tank with O<sub>2</sub> in it and this is where all the O<sub>2</sub> is going to be sorted, it is also the home for the plankton.

We will also have fans and other suction devices to remove CO<sub>2</sub> from the rooms so it can't hurt anyone. The CO<sub>2</sub> is then to be fed via pipes back into the plankton and over to the bio dome for the plants.

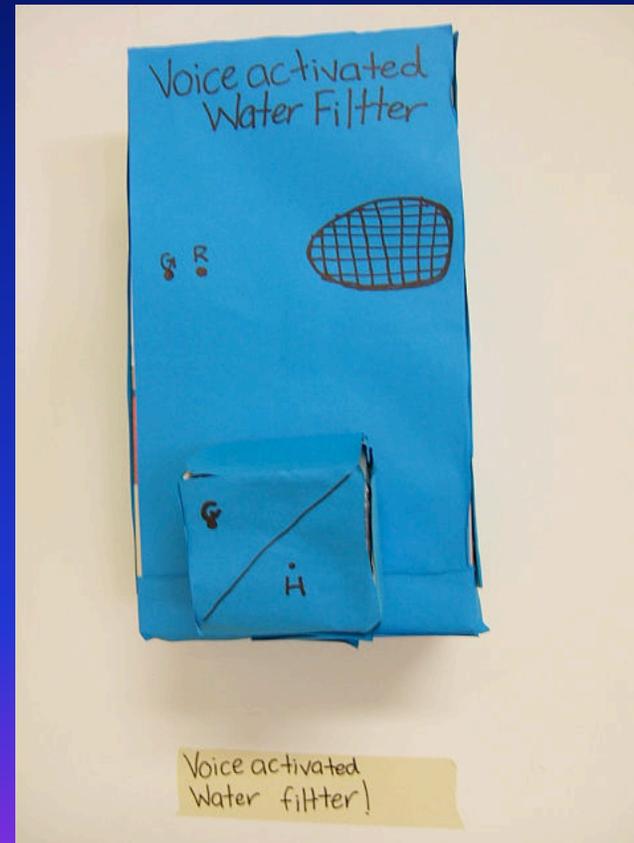


# Emergencies

The tank is also for emergencies. Like if there is a room that has no oxygen in it then there are going to be people who check the monitors. They will then use a release button to get a pipe to take the  $O_2$  to the correct room.

To tell people that they need to watch the oxygen levels there will be a red flashing light and a beeping sound.

We are also going to have voice activated water filters. This ensures that the water the astronauts are drinking is clean.



# Conclusion

Thank you for taking the time to look at our design.

We really enjoyed the construction of the Moon Base.

We would like to thank NASA for making this possible, our teacher Mr Gleeson for his help, and Rachael for coming in and helping out .