



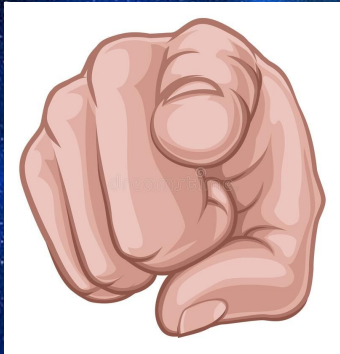
Luyten b

# OUTER SPACE- A NEW FRONTIER

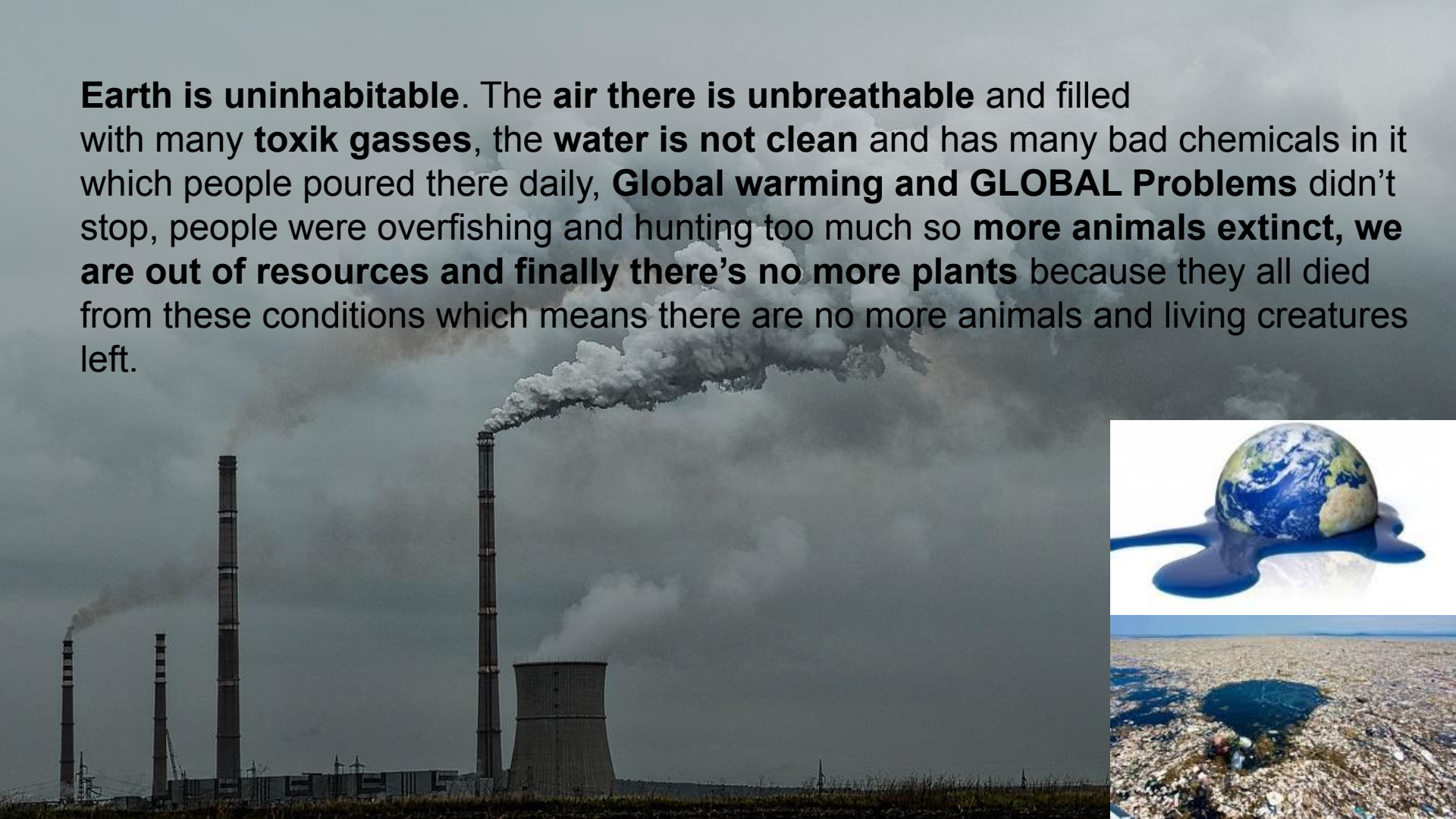
*The survival of the HUMAN RACE depends on*  
**YOU and the CREW** on board.

**YOUR MISSION** is to:

- **Decide on the design and structure of your spacecraft.**
- **Agree on what 30 people will need to survive for 5 years in space.**
- **Compare the new planet to Earth with the possibility of relocating Earth's inhabitants.**



**Earth is uninhabitable.** The air there is **unbreathable** and filled with many **toxik gasses**, the **water is not clean** and has many bad chemicals in it which people poured there daily, **Global warming and GLOBAL Problems** didn't stop, people were overfishing and hunting too much so **more animals extinct**, **we are out of resources and finally there's no more plants** because they all died from these conditions which means there are no more animals and living creatures left.



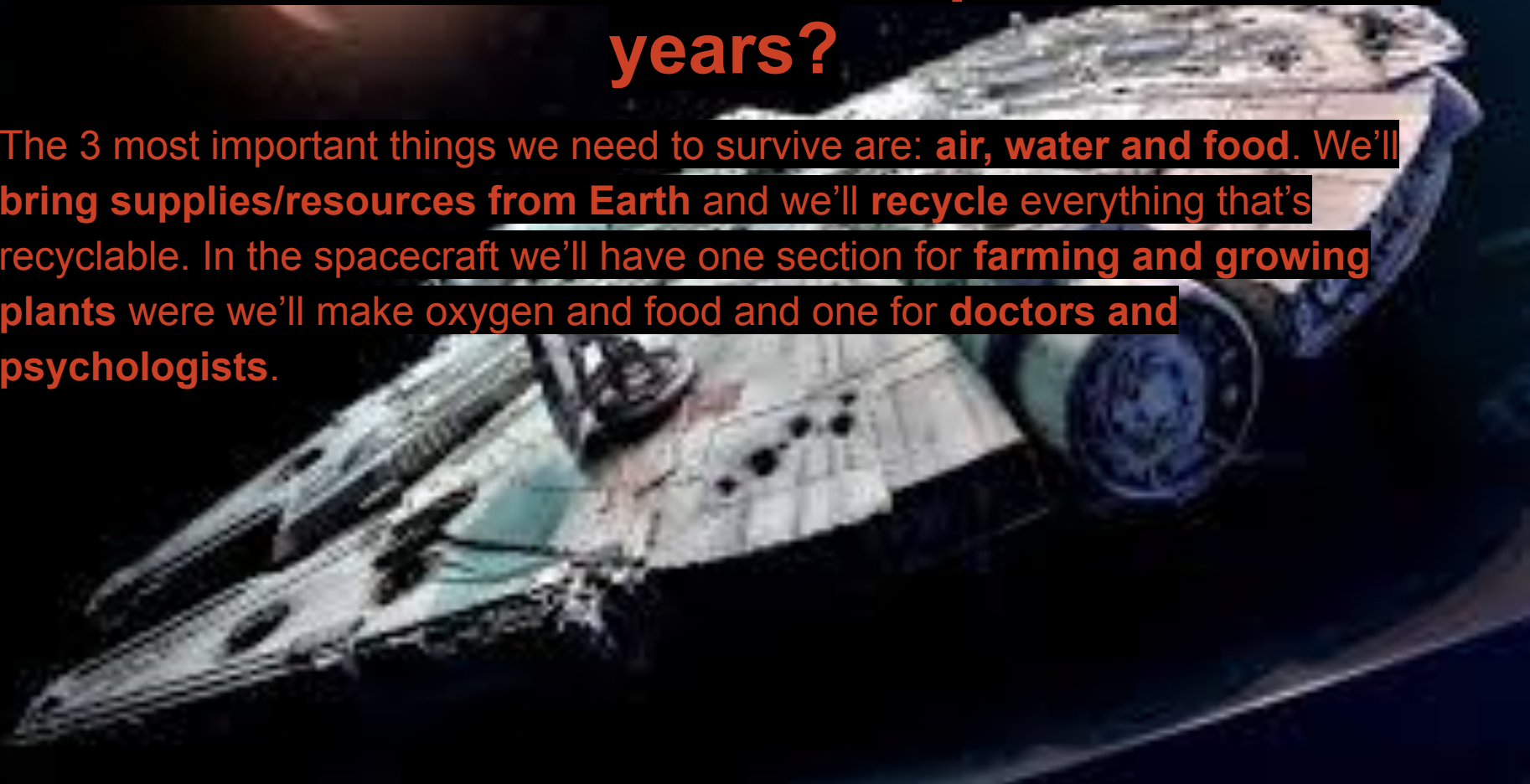
# Our Mission

Since Earth is uninhabitable we're going on a mission in a futuristic spacecraft **JANUS** to outer space to relocate on a new exoplanet **Luyten b**. The spacecraft is **named after a roman god of of beginnings**, gates, transitions, time, duality, doorways, passages, frames, and endings. The name represents an **ending of life on a planet and a long journey to start life on a new planet**.

My spacecraft uses **Super Solar Electric Propulsion Power Engines and Antimatter Engines**. They're both very powerful engines that can get us to the planet in 5 years. My spacecraft also uses **fake gravity** which means we can walk in the spacecraft.

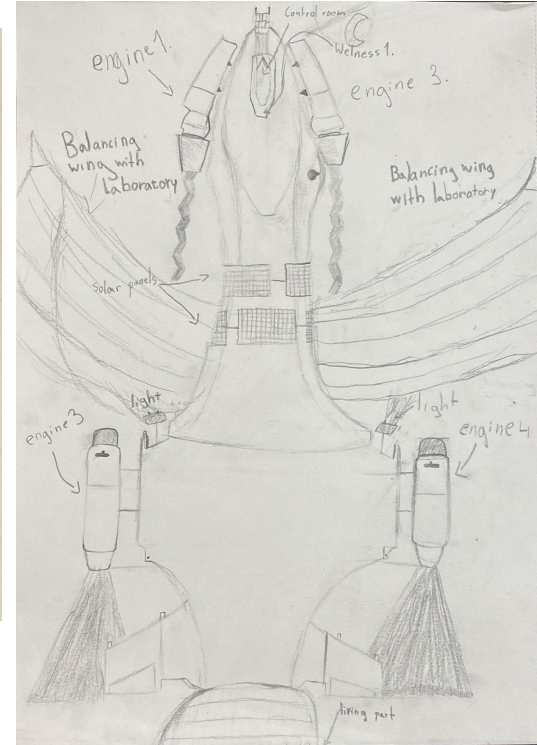
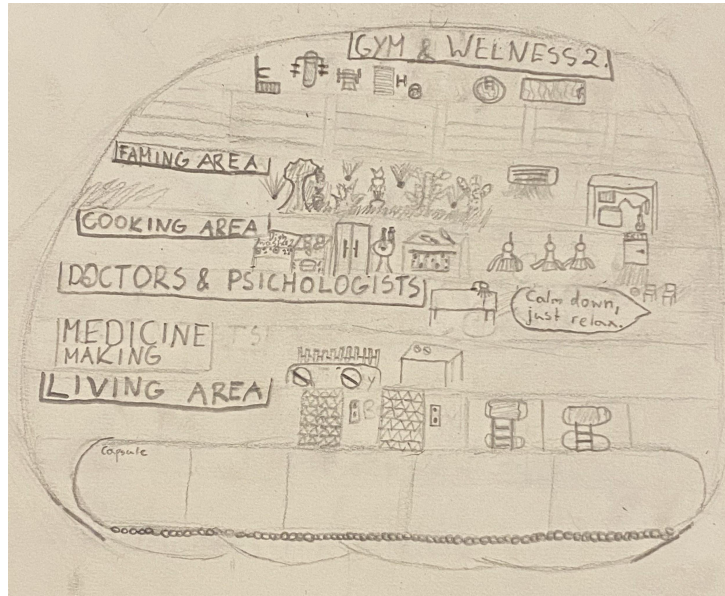
# How will we survive in the spacecraft for 5 years?

The 3 most important things we need to survive are: **air, water and food**. We'll **bring supplies/resources from Earth** and we'll **recycle** everything that's recyclable. In the spacecraft we'll have one section for **farming and growing plants** where we'll make oxygen and food and one for **doctors and psychologists**.



# Sections in the spacecraft

- In the top of the main section of the spacecraft we have a **gym** and a second **wellness**.
- Underneath it we have a **floor for engineers**.
- Bellow that we have a **floor for farming and growing plants** were we'll make oxygen and food.
- Then we have a **floor for cooking**.
- A floor for **doctors and psychologists**.
- A floor for **scientists**.
- And on the bottom of the main section is a **floor with bedrooms**.



# How will we make oxygen, food and water on the spacecraft?

- **Oxygen:** An electric current is passed through water molecules to break them down this process is called electrolysis. So after that, we have 2 hydrogen atoms and 1 pure oxygen atom. Now we'll collect the separated oxygen molecules in special cylinders, and astronauts can breathe easy. The remaining hydrogen molecules go through something called the Sabatier reaction. They mix the hydrogen with carbon dioxide to create water. Unfortunately the amount of oxygen that this system makes per day is only enough for two people, so we also need to use other sources.  
**Plants can make oxygen** with a process called photosynthesis. In nature **photosynthesis** requires sunlight, chlorophyll, water, and carbon dioxide gas. But instead of the plants having real sunlight they will have artificial sunlight.

- **Food:** We'll have freeze-dried packets of astronaut food, and we'll grow fresh fruits, vegetables, beans, grains and other crops in the farming area by planting seeds (that we bring from Earth) in a Veggie box with red, blue and green lamps that each provide a certain growing condition for the seeds.
- **Water:** We'll recycle water by collecting waste water and urine which we'll then send through many filtering systems in the science labs until it's clean and drinkable.



A futuristic spacecraft cockpit with two pilots seated at a control panel. The panel features multiple screens displaying data and a central display showing a green map or interface. The cockpit is dimly lit, with the primary light source being the screens and ambient lighting from the cabin.

# Different roles of different people on my spacecraft.

On the spacecraft we'll have: 5 scientists, 5 astronaut explorers, 2 doctors, 2 nurses and 1 psychologist, 5 engineers, 6 farmers, 2 pilot cosmonauts, 2 copilots and the other staff will be robots.

# How fast do we need to go to get to Luyten b in 5 years?

To get to Luyten b in five years we would have to go 2,646,058,309.171023 km/hr.



# Challenges we may encounter in the spaceship

A photograph of an astronaut in a white spacesuit working on the exterior of a large spacecraft in space. The Earth's blue and white clouds are visible in the background. The spacecraft's structure, including various panels and equipment, is visible in the foreground.

Some part or system of the spacecraft may break or malfunction but we'll have skilled engineers that are highly trained to solve these type of problems.

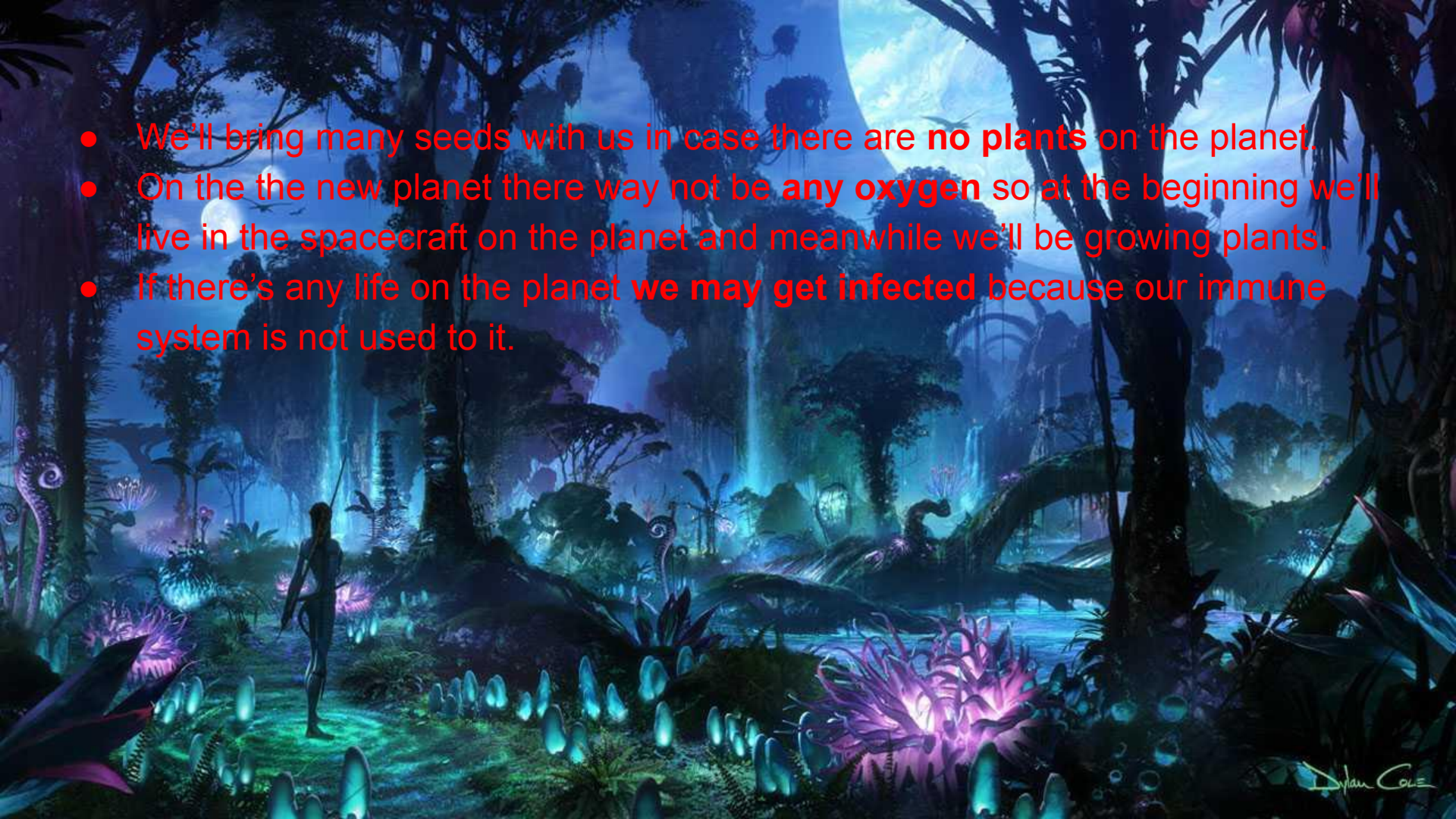
Some flying space object may hit the spacecraft, but my spacecraft is in a bubble shaped, invisible shield that protects the spacecraft, so no asteroid or other space object can destroy it.

If there are any technical problems on the spacecraft, and all if the engineers have to do something else we have many robots that can do almost any job.

# Challenges we might encounter on the new planet

- There might be **aliens** or other creatures on the new planet. If the creatures would be kind we could make an agreement for us to stay on the planet with them but not do any harm to them and live peacefully. If they would be unkind and aggressive we'd try to make an agreement so we could live on one quarter of the planet and them on the rest.
- There will be **higher gravity** which means we'd have to build smaller houses and elevators instead of stairs because there you weigh approximately 1.5 how much you weigh on Earth which means it would be harder to go up.

- We'll bring many seeds with us in case there are **no plants** on the planet.
- On the the new planet there way not be **any oxygen** so at the beginning we'll live in the spacecraft on the planet and meanwhile we'll be growing plants.
- If there's any life on the planet **we may get infected** because our immune system is not used to it.



# Its Location

Luyten b is located in the constellation of **Canis Minor**.  
It orbits within the habitable zone of the nearby red dwarf **Luyten's Star**.



# Distance from Earth

It would take **12.2 light years** to get to Luyten b from Earth.

# Distance from the star.

Luyten b is **13 million kilometers** or 0.091101 AU (AU- astronomical unit represents the distance between the Earth and our sun and it is equal to about 150 million kilometres) from its star called Luyten's Star **and is in the Goldilock zone.**

*Danville*

# Its size

Luyten's b, GJ 273b

The radius of Luyten b is **1.35 x Earth** (estimate) and its mass is **2.89 Earths**.



Earth





# Its Temperature

Luyten b has an **equilibrium temperature** (is a theoretical temperature that a planet would be at when considered simply as if it were a black body being heated only by its parent star) of 259 K (-14 °C; 7 °F). For comparison, Earth has an equilibrium temperature of 255 K. With an Earth-like atmosphere—if it has one—Luyten b would have an average surface temperature of about 292 K (19 °C; 66 °F), very similar to that of Earth.

# Its Atmosphere

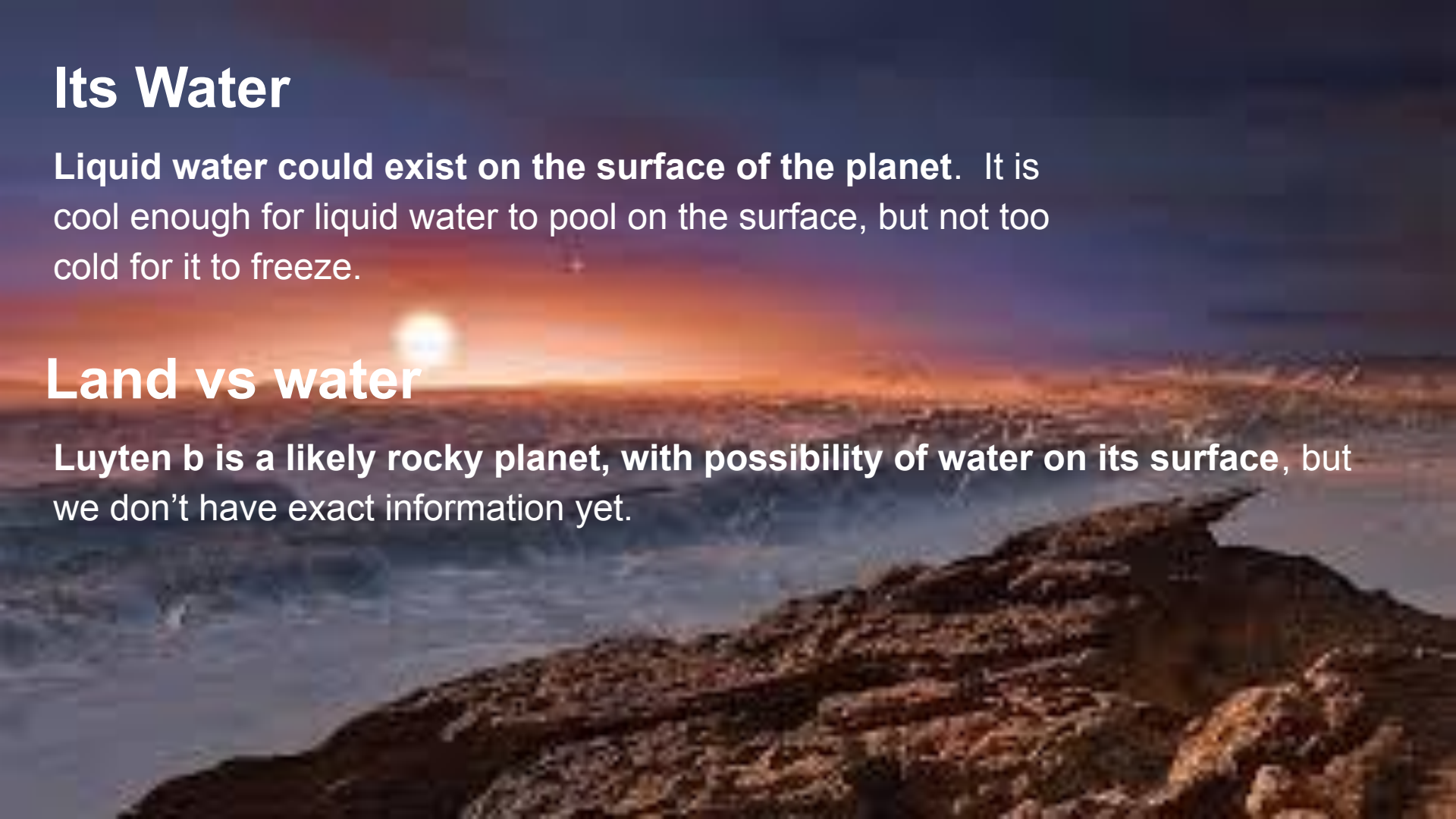
Luyten b is orbiting a very quiet host star called Luyten's Star. With the low activity of its host, Luyten b is likely to retain any atmosphere for billions of years, potentially enabling the development of life as we know it.

# Its Water

**Liquid water could exist on the surface of the planet.** It is cool enough for liquid water to pool on the surface, but not too cold for it to freeze.

## Land vs water

**Luyten b is a likely rocky planet, with possibility of water on its surface , but we don't have exact information yet.**



# Rotation year

It takes **18.6 days** for Luyten b to complete one orbit of its star (Luyten's Star).

# Rotation day

Unlike most planets this close to their parent star, **Luyten b is probably not tidally locked**. It is likely to be in some sort of spin-orbit resonance, meaning that **it may rotate twice per orbit, or three times per two orbits**, or another similar resonance.



# Gravity of Luyten b

The gravity of Luyten b is  $15.50 \text{ m/s}^2$  which is **1.58 g** (Earth gravities). Earth's gravity is  $9.8 \text{ m/s}^2$ .



# How will life on Luyten b be like compared to Earth?

Luyten b is one of the most **Earth-like** planets ever found. It is likely a **rocky planet** orbiting within the habitable zone of Luyten's star. It is a Super-Earth around **3 times the mass of Earth** and a **radius 1.4 times Earth**.

It has an **equilibrium temperature of 259 K** (-14 °C; 7 °F) and its surface temperature could be 19 °C which is similar to that on Earth. For comparison **Earth's equilibrium temperature is 255 K**.

**Luyten b is 13 million km from its star** which is much closer than Earth to the Sun (149,6 million km), but **Luyten's star is relatively a cool star** around a **quarter the mass of the Sun** and therefore the planet receives only 6% more starlight than Earth.

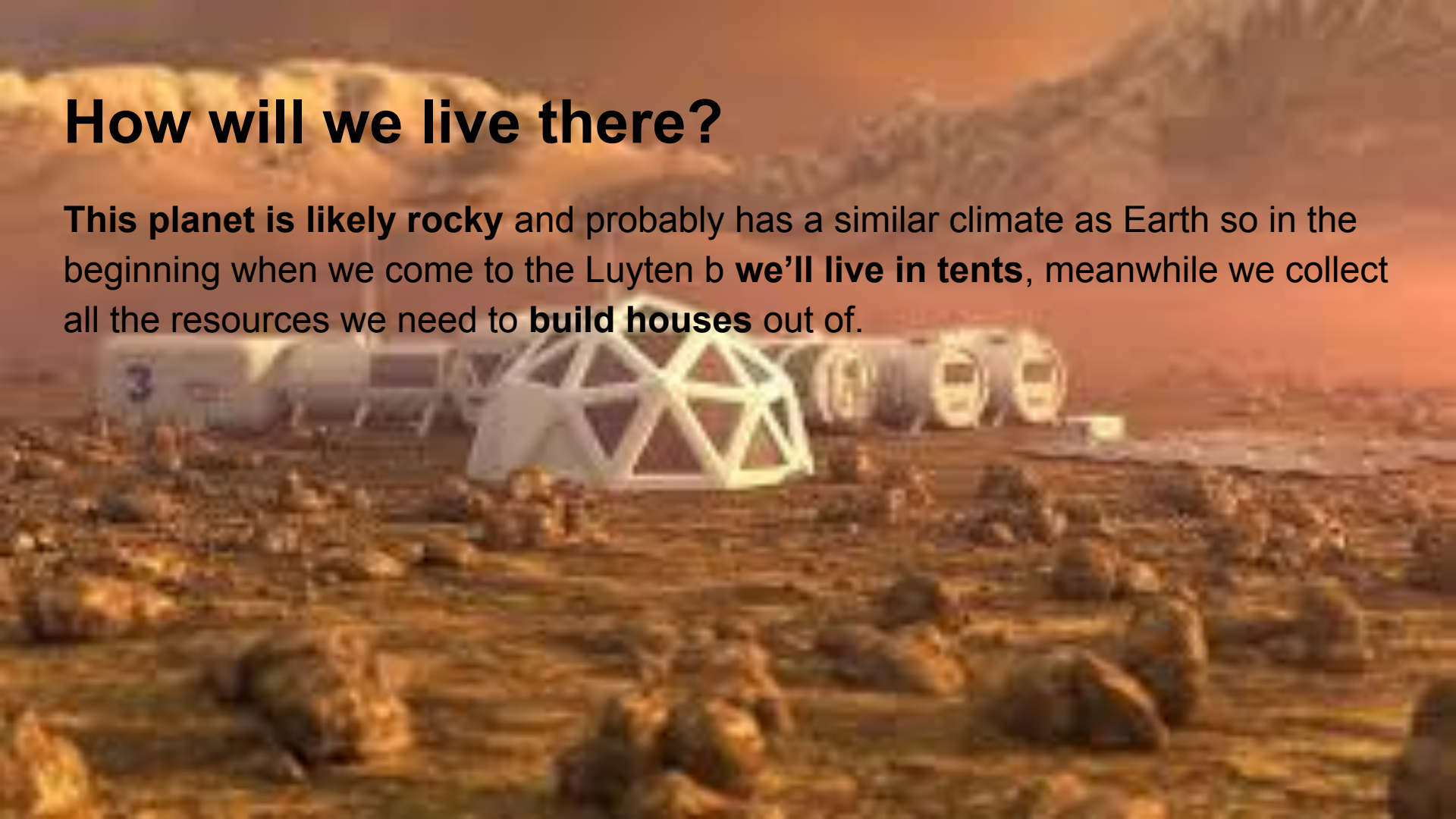
Since **Luyten b rotates way slower than Earth** the days and nights would be longer which means that there will probably be higher variations in temperature between night and day.

**Gravity on the surface of Luyten b is 1.58 g** (bigger than on Earth), that means you need to put more effort for you to move and our bodies will probably gain more muscles to overcome the gravity.



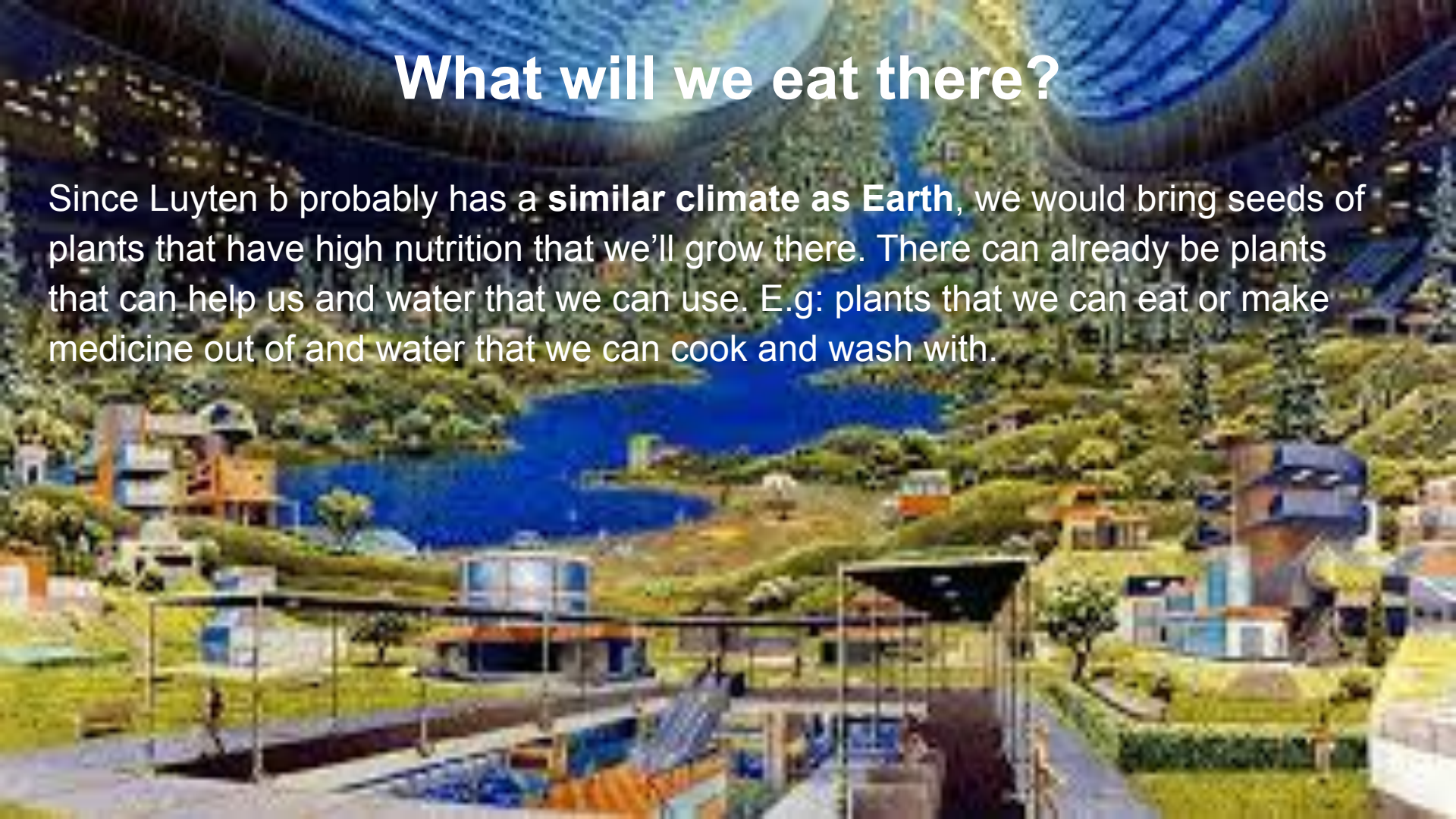
# How will we live there?

**This planet is likely rocky** and probably has a similar climate as Earth so in the beginning when we come to the Luyten b **we'll live in tents**, meanwhile we collect all the resources we need to **build houses** out of.



# What will we eat there?

Since Luyten b probably has a **similar climate as Earth**, we would bring seeds of plants that have high nutrition that we'll grow there. There can already be plants that can help us and water that we can use. E.g: plants that we can eat or make medicine out of and water that we can cook and wash with.





# How did I show Core Values?

- I showed **compassion** when I sacrificed my lunch break to help Tomaš make his parachute.
- I showed **responsibility** by always trying to give away the homework in time and make it the best as possible.
- I showed **hope** by hoping my work would be good and liked by Mr. Daniel.
- I showed **wisdom** by learning and understanding scientific terms.

# Connections we made with the GLOBAL GOALS



- I connected my work with **GLOBAL GOAL 5, gender equality** because people who will have to do anything with the spaceship will be women and men, and they will be equally paid.
- We'll also use solar engines and electricity from solar panels on my spacecraft which connects with **GLOBAL GOAL 7, affordable, clean energy.**
- We'll recycle water and make sure it's all clean and drinkable because we'll use it for many things on the spacecraft so it's important for it to be clean. This connects with the **GLOBAL GOAL 6, clean water and sanitation.**

# How would I take ACTION?



I would take action by **helping the Earth.**

I would do that by organising **3 types of events:**

- One will be where we'll pick up trash
- One where we'll grow plants
- And the last one where we'll be cleaning water

I'll also **start a club** where I'll educate people about the environment and **put up posters** and a **campaign on social media** where I'll persuade people that we need to be active and responsible to save the Earth.

# How did we link this to subjects?

- **English:** We did a lot of research and persuasive writing.
- **Math:** We calculated gravity of our planet, how fast do we need to go in to get to our planet in 5 years and did a gravity experiment with parachutes where we had to measure and calculate stuff.
- **Art:** We designed our spaceships and our parachutes for our gravity experiment and made our own planets.
- **ICT:** We did a lot of research about our planet and made presentations.
- **Science:** Everything we did is basically science.
- **Global Goal:** We linked it to the Global Goal 6: clean water and sanitation, by collecting dirty water and waste liquid on the spacecraft so we can clean it and it'll be drinkable water again.

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**Thank you for your  
attention!**