

SPACE DRINKING

- gravity free facility in space for drinking

With the rapid development of the aerospace industry, improving the quality of life for astronauts in space has become a focal point. Due to the particularity of space environment, drinking water in the space remains inconvenient for astronauts. I will focus on using edible film packaging to design a series of products to enhance astronauts' drinking experience.

• Video List: <https://youtu.be/ZiXEL-N7Bdc>



BACKGROUND

In the **weightless** expanse of space, the absence of gravity poses a significant challenge to the simple act of drinking water. Conventional methods fail as liquids form **floating globules**.

DRINKING IN SPACE



No gravity

Without gravity, we can't use bottles to drink water in the space station, which may **cause asphyxia**.

Sealing bag

Water is packed in the sealing bag which we can squeeze to suck in. But be careful, you can't use too much force, as the water will **splash**.



High requirement

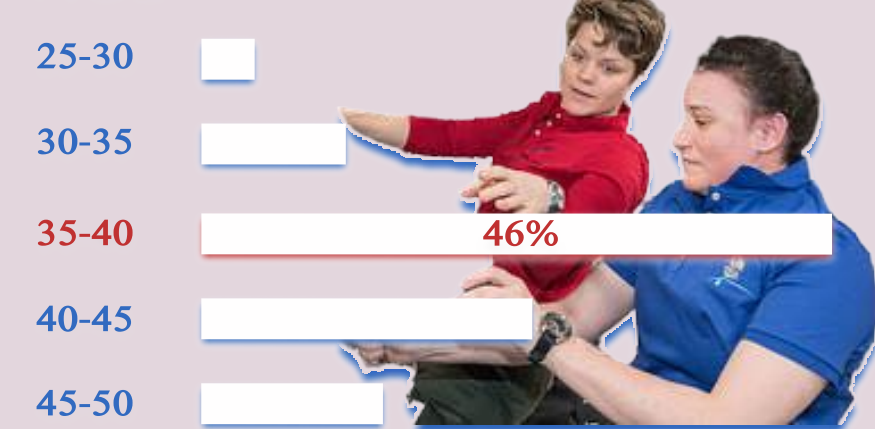
On average, we need to drink **2kg** of water every day.

OBSERVATION

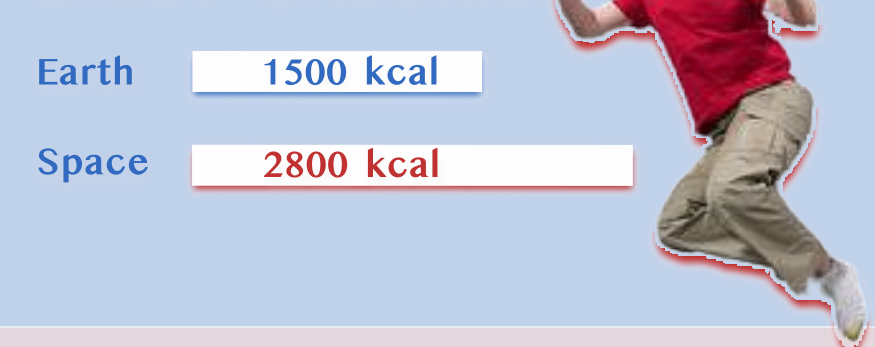
WHEN INSUFFICIENT WATER INTAKE



AGE



DAILY CALORIES



GARBAGR DISPOSAL



ASTRONAUT JOURNEY MAP

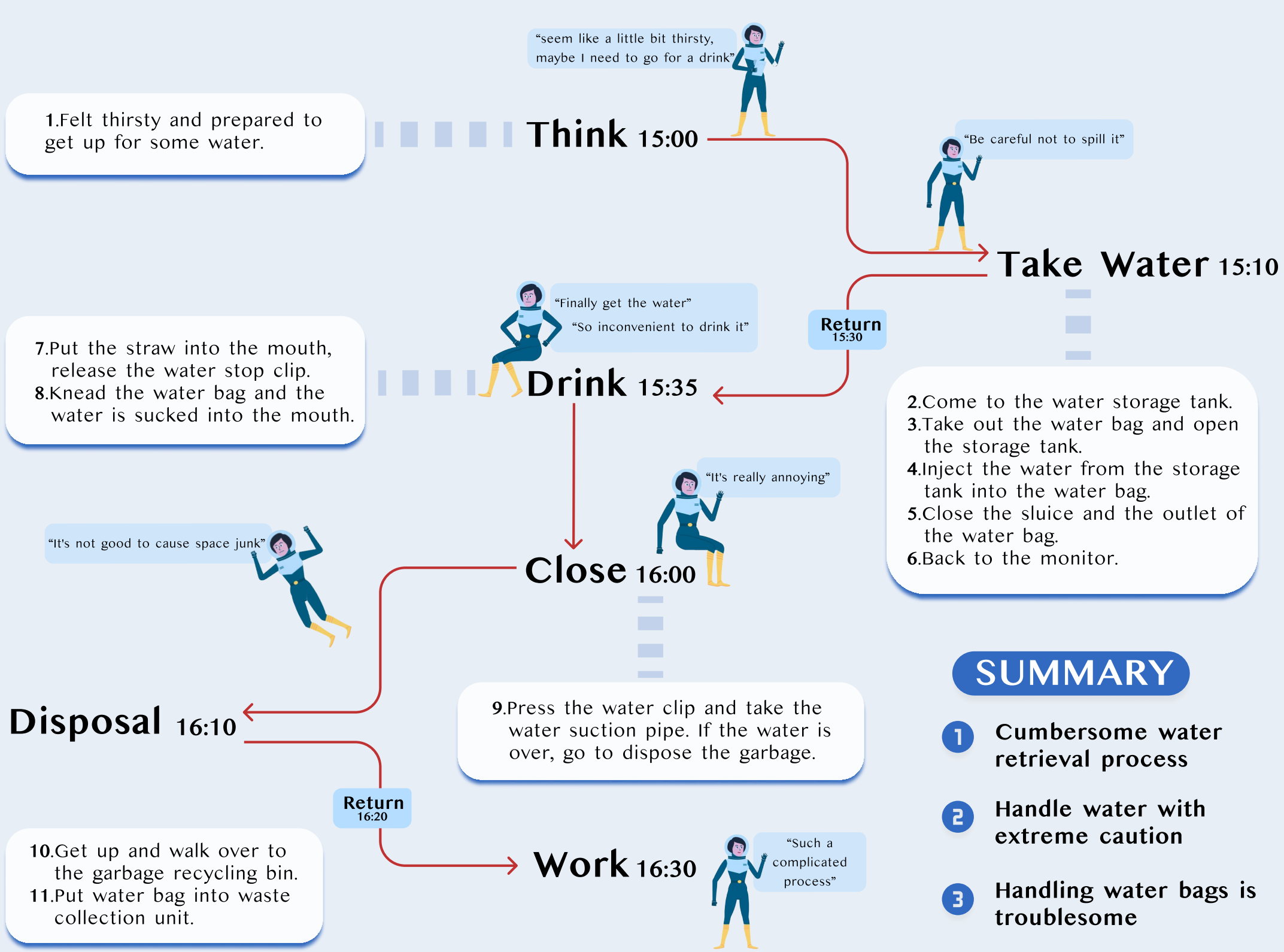


Katlin is an astronaut in the space station.

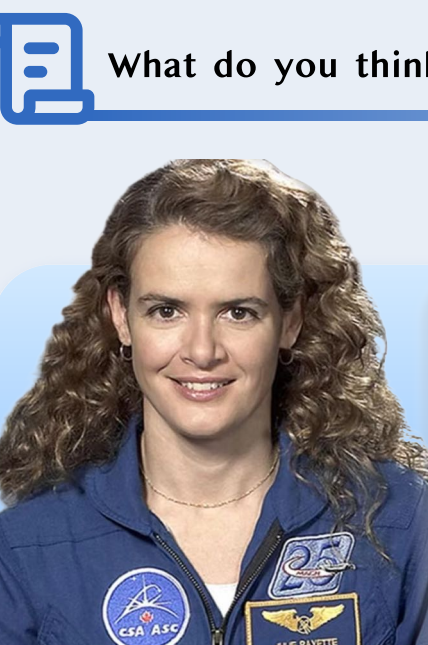
Scenario : At 3 pm, Katlin was doing the maintenance work at the space station. She suddenly **felt thirsty** and prepared to get up for some **water to drink**.

EXPECTATION

- Reduce the time of preparing water
- Make drinking water more convenient
- Facilitate the garbage recycling



INTERVIEW



What do you think is the **shortage** of the water drinking in space ?

Life situation in space :
Katlin Green is the only female astronaut on the space station. In addition to daily maintenance, she also needs to conduct space experiments. During this mission, she has already worked in space more than 100 days and every working day was **intense**.

Core need :

- Reduce the time of preparing water
- Make drinking water more convenient
- Facilitate the garbage recycling process

Favorite drinks :

- Coffe
- Tea
- Orange juice
- Lemon juice

Frustration :

- Need to **take a long time** to prepare
- Need to **be very careful** when drinking
- Need to take time to **dispose with the trash**

Name: Katlin Green
Age: 36
Location : space
Job :astronaut

I'm tired of drinking water so carefully in space. How I wish I could drink it as I do on earth.



Ben

- Inconvenient to drink



Mark

- Difficult to recycle
- Causing pollution



Alva

- Poor taste



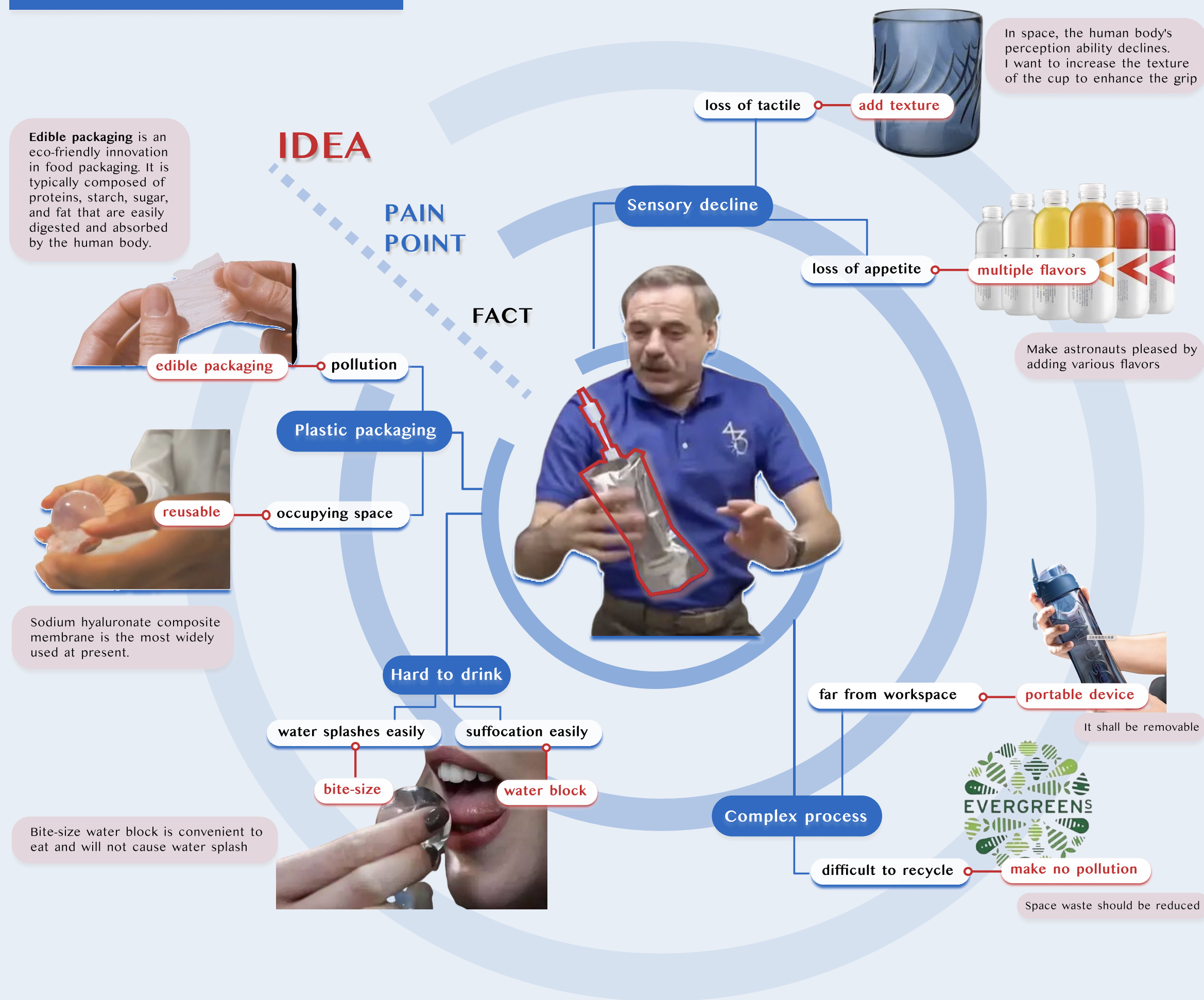
Katlin

- Take a long time
- Physically exhausted



According to the **17 sustainable development goals** proposed by the United Nations, I'm committed to **reducing pollution** in space, optimizing astronauts' drinking experience, making food packaging **sustainable and reducing waste**.

BRAIN STORM



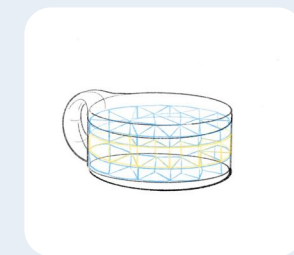
DRAFT PLAN

Type 1

After deciding to use edible film to pack water blocks, the first solution I came up with was to stack **triangular water blocks** in a circular container. Stick a **finger cap** on each water block for easy access. **Color** is used to represent different taste of water.

weakness

- Small capacity
- Few choices

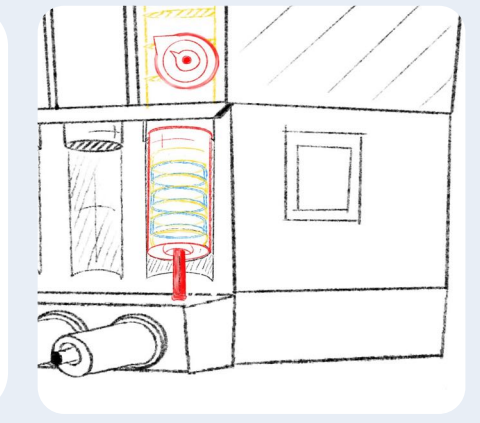
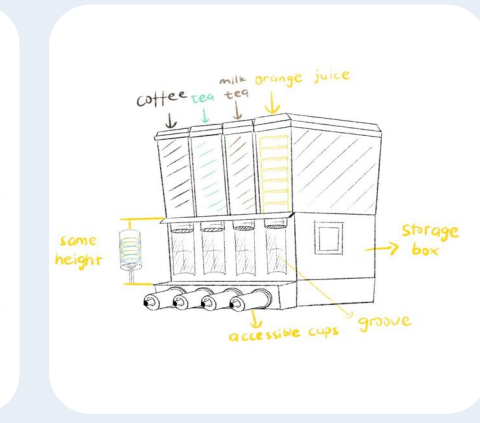
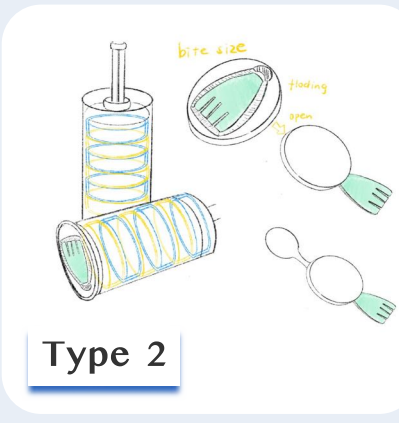


Type 2

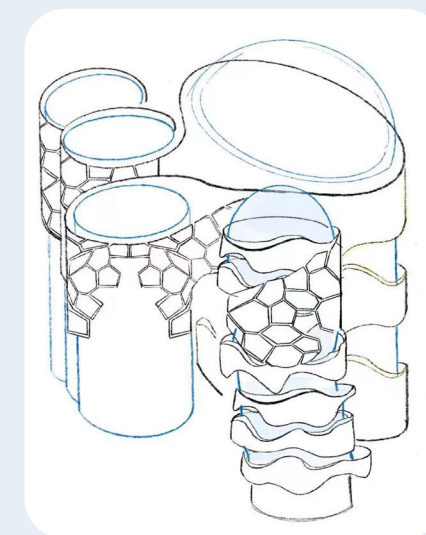
Four beverage boxes with same width and cup-fit water outlet, magnetic suction for easy fixing, and knob to produce one-bite water blocks. Water storage tank for balls and cups. Cap design: foldable spoon or embedded syringe shape.

weakness

- Boring looking
- No sense of space

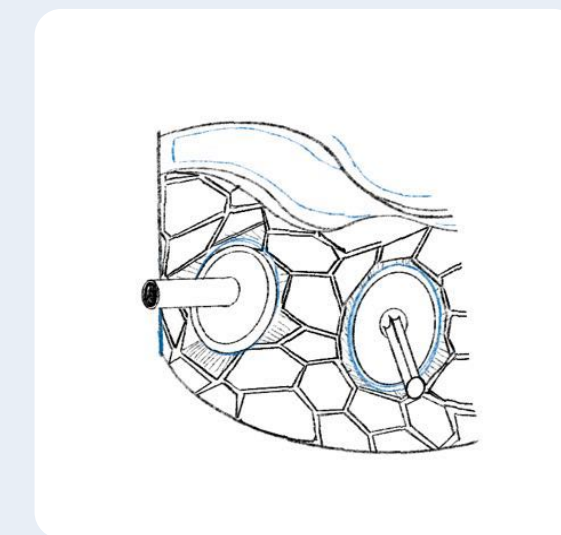
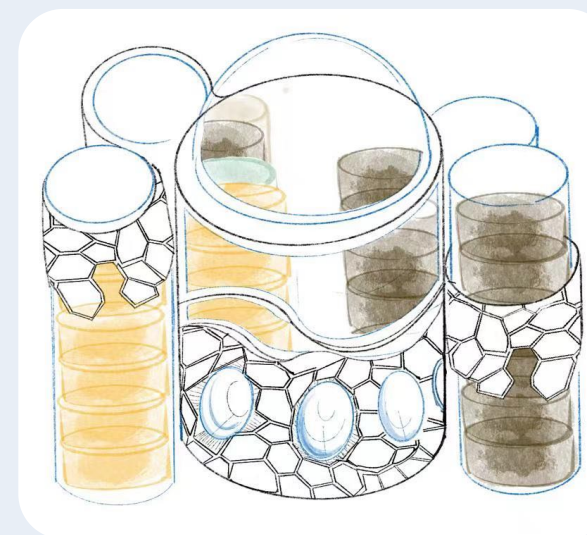


MODIFIED



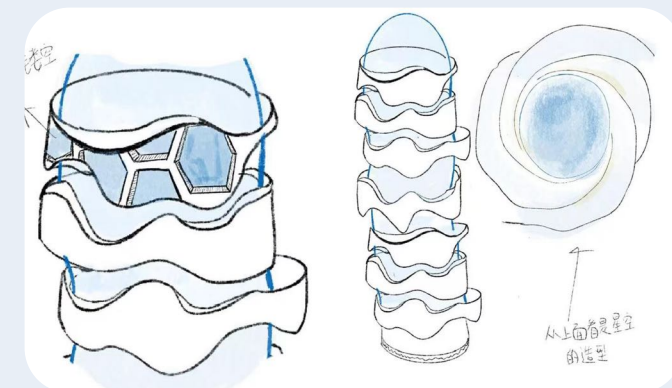
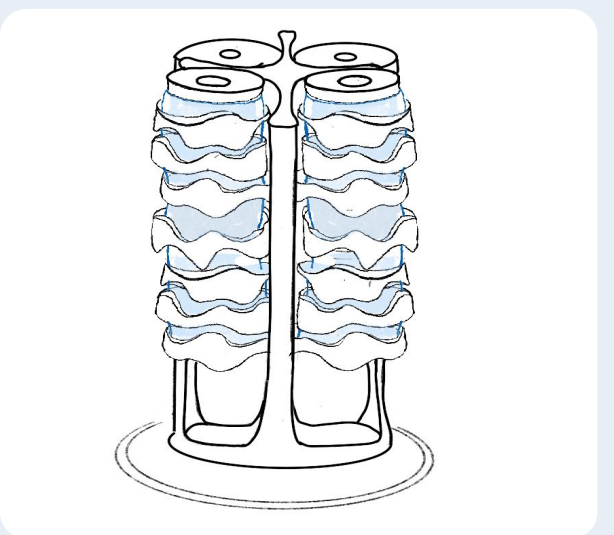
Water tank

- The water tank in the middle can meet the daily drinking water volume of **3 to 4 astronauts**.
- The water is wrapped with edible film, just the bite-size.
- There are **four flavors** distinguished by **color**



Water cup & Rotating device

- The water block can be moved from the kettle to the cup to meet every drinking.
- The cup can **be placed in the hole** at the bottom of the water tank.
- The kettle can be placed on the rotary device for use

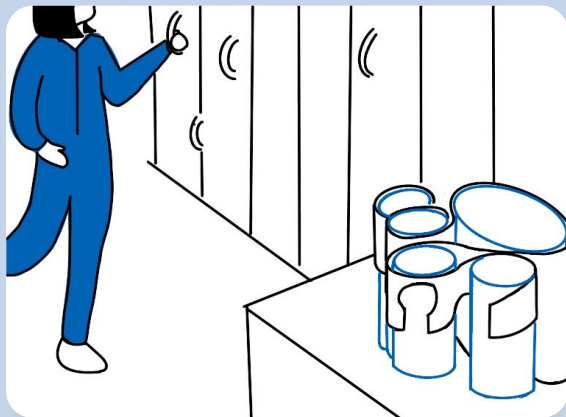


Water kettle

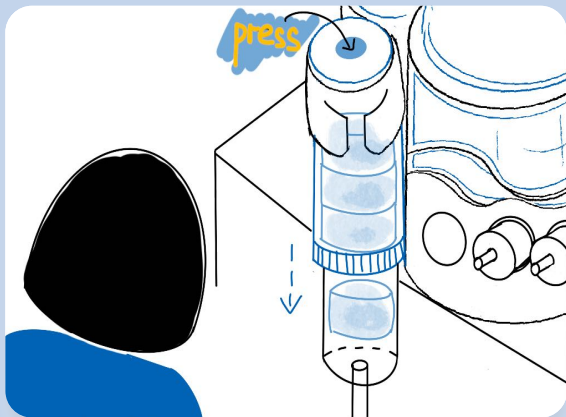
- The water block can be put into the kettle from the water storage tank
- The capacity of a cup is **2L** to meet the needs of an astronaut for half a day.
- The kettle is **magnetic**, which can be adsorbed on the wall for easy access
- The kettle looks like a nebula in the top view.
- The **rubber strip** on the wall can **increase the grip**.

I will focus on the above pain points and use the modern technology of **edible film packaging** to design a **weightless drinking device** that can improve the astronauts' drinking experience.

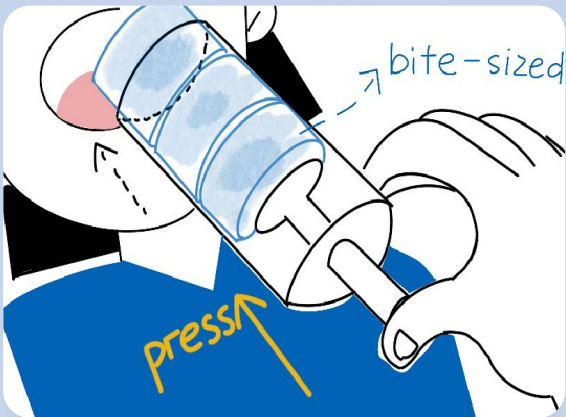
SCENARIOS



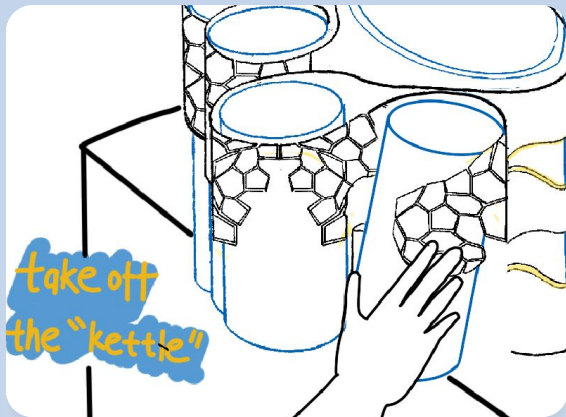
1 Katlin goes to the dining area for a glass of water in the morning



2 Use a Push-Push cup to stack a block of water from the dispenser.



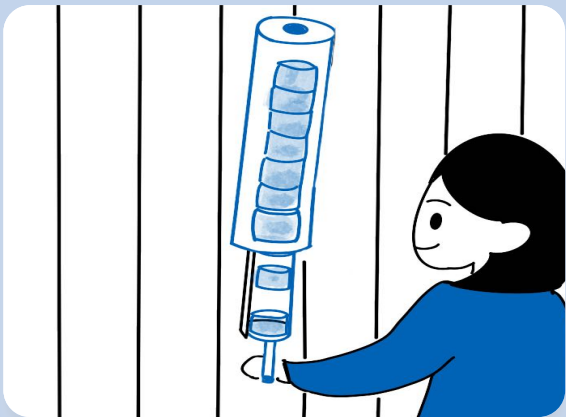
3 Push the slider at the bottom of the cup to drink water block.



4 Retrieve kettle from the magnetic suction point on the water tank.



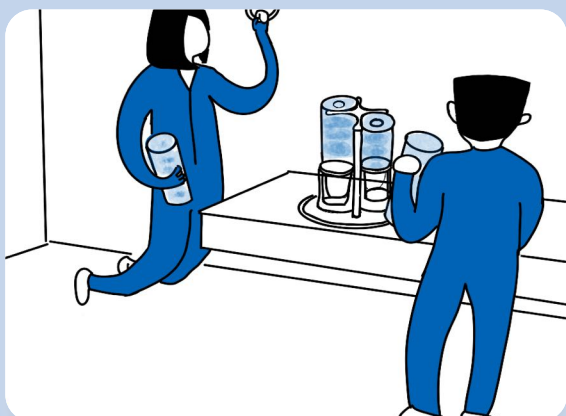
5 Suction the kettle onto the wall of the workspace.



6 Katlin can pick up a cup whenever she want.



7 She can comfortably drink water while working.



8 At lunch time, she can take the kettle to the dining table.



9 Put it on the rotating tray, can have whatever she wants to drink.

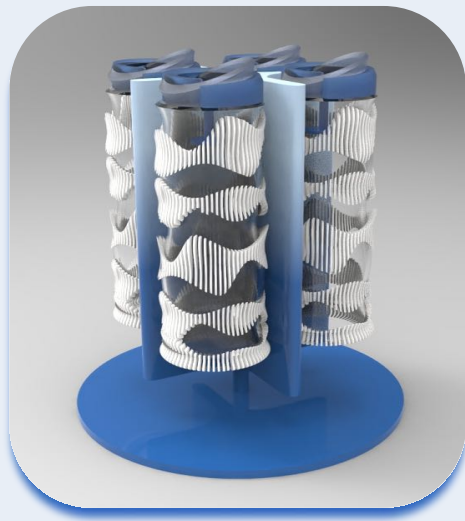
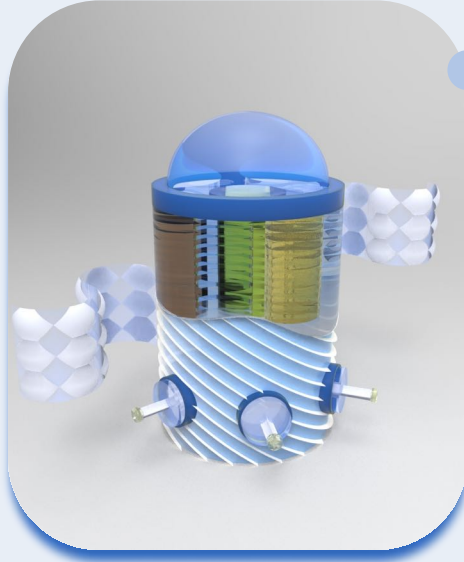
MODEL

Water tank

size
r : 8cm h : 40cm
The water tank can meet daily drinking water volume of 3 to 4 astronauts.



Multi Flavors



Material
Body :
• transparent
clearly see the amount of water
• magnetic
directly adsorbed on the wall
stripes:
• rubber
increase friction to enhance grip

Water cup



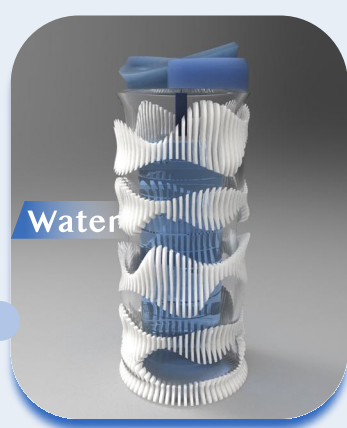
Size
r : 3cm h : 40cm



The 2L cup fulfills half-day hydration, while magnetic kettle sticks to the wall for easy access.

Multi Flavors

The water block of the edible film can be convenient to drink and can receive multiple flavors in one cup.



Rotating device

The kettle can be placed on the rotary device for use, especially during group meals.

size
r : 10cm h : 40cm

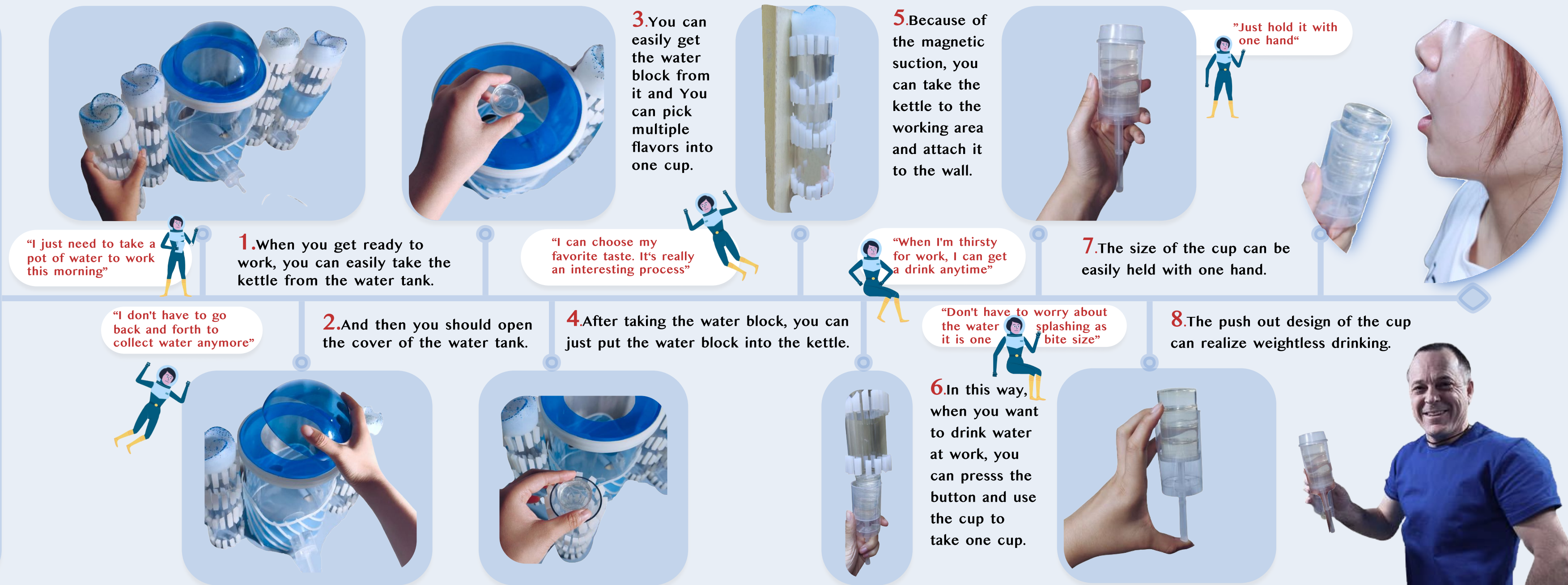
MAKING PROCESS



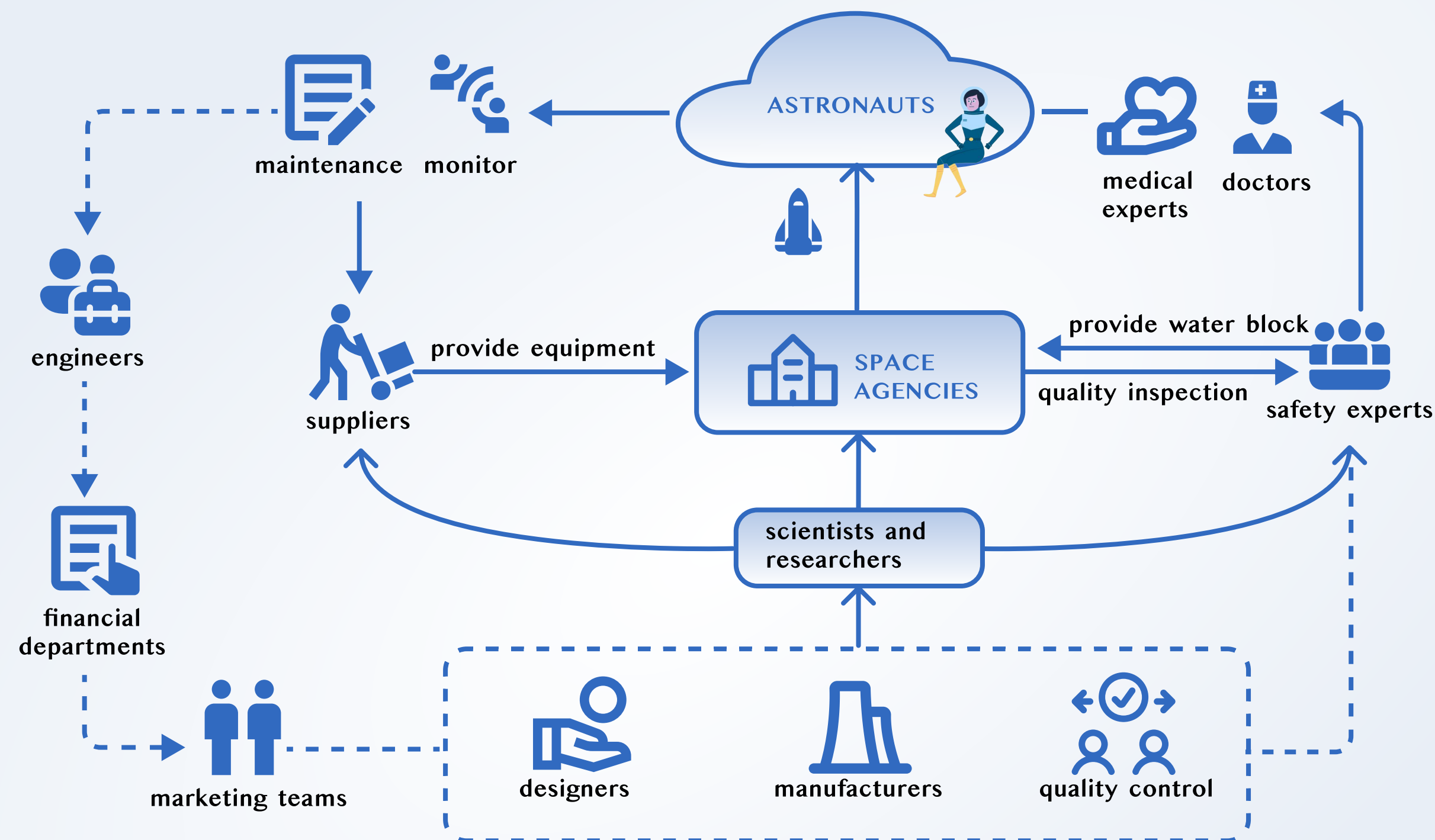
FINAL PRODUCT



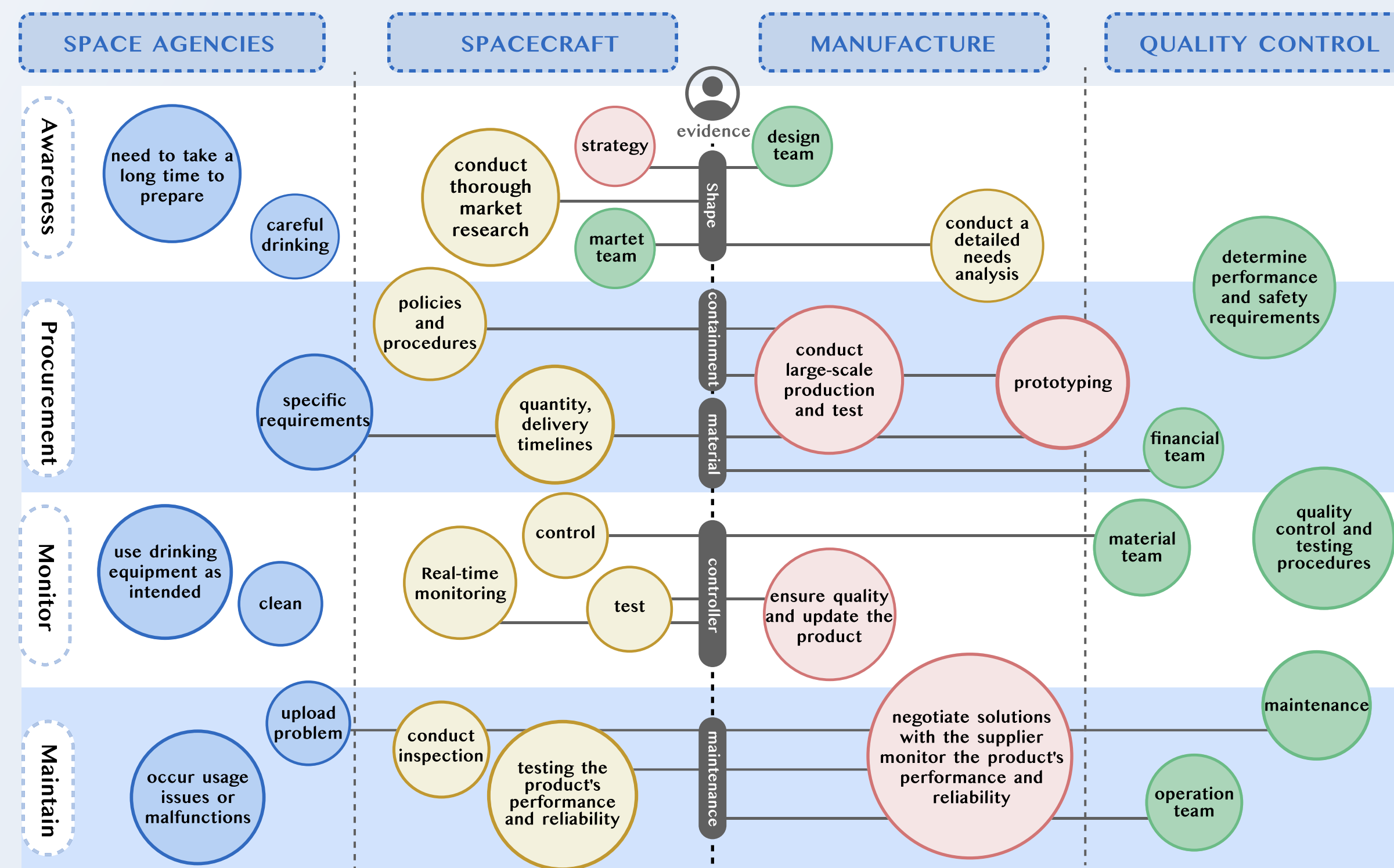
DRINKING PROCESS



STAKEHOLDER MAP



SERVICE BLUEPRINT



INTERVIEW & REFLECTION



