A SPACE STATION

In the following, the text between " " suggests what to say to the children. Questions are in **bold** and actions in *italics.*

This symbol indicates:
things to look at

This symbol indicates:
action to take/activity to do

This symbol indicates:
explanations to delve deeper into the subject

THE MIR SPACE STATION

This is an actual life-size model used for resistance tests for the real Russian space station, MIR.

You can visit inside by taking the ramp that starts on the small square at its base.

Exterior

(below, at the base of the MIR station)

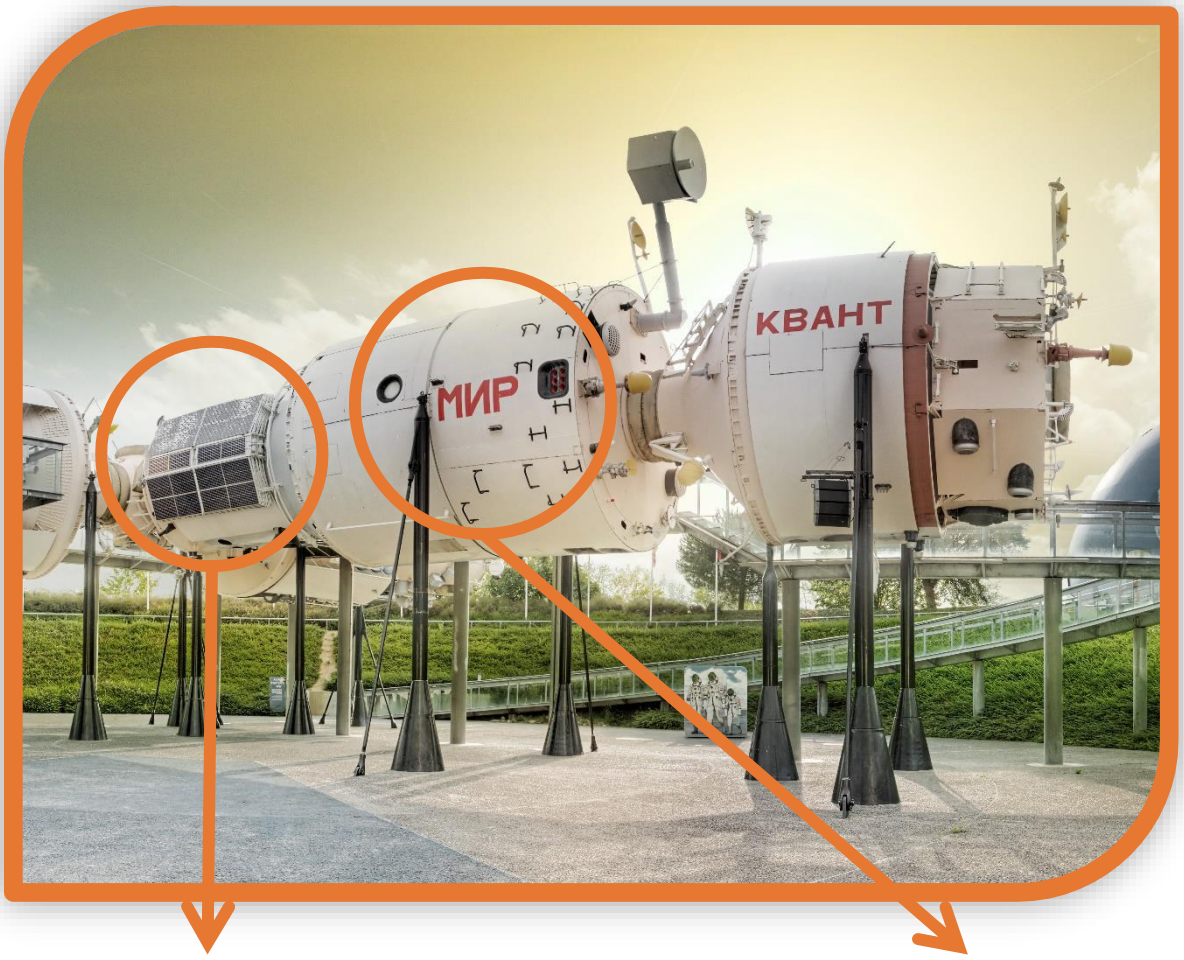
“A space station is positioned even higher than the sky above us (space is defined as starting at an altitude of 100 km, and the station is at an altitude of 400 km).
Astronauts live inside space stations. An astronaut is a grown-up who works in space. This space station is where astronauts lived and worked for 6 months at a time. It was their home in space.”

“The station is made up of different modules attached to each other. Look, you can add another module on this side using the connector.”

“Can you describe the space station?”
It is white with red writing on it. “**Can you name any of the parts it’s made up of?”**
Antennas, handles, blue panels, etc.

Exterior

(below, at the base of the MIR station)



“To supply the astronauts’ home with electricity, the station has to use solar panels that transform light from the Sun into electricity, because it's too far to send an electric cable into space.

Can you see the solar panels?

They are folded away, but they’re blue with squares on them.”

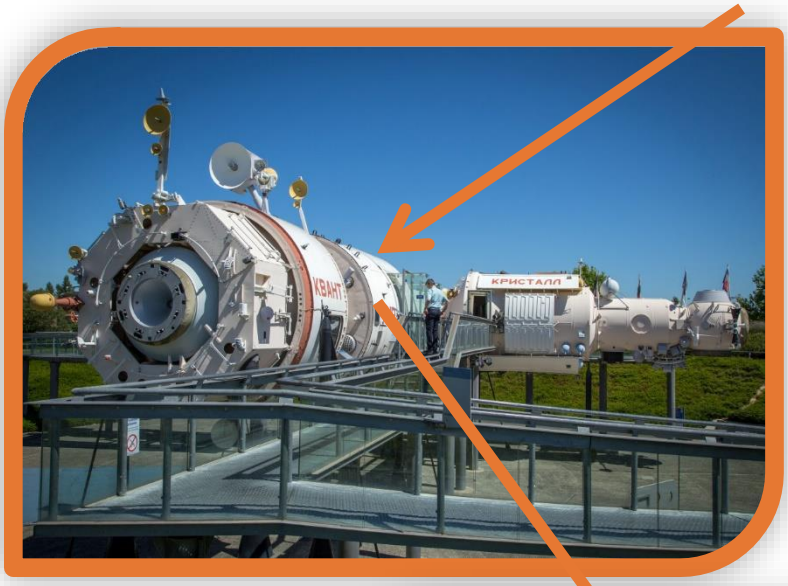
“This space station was built by the Russians. Its name, MIR, is written in Russian, which is a language that doesn't use the same alphabet as ours.

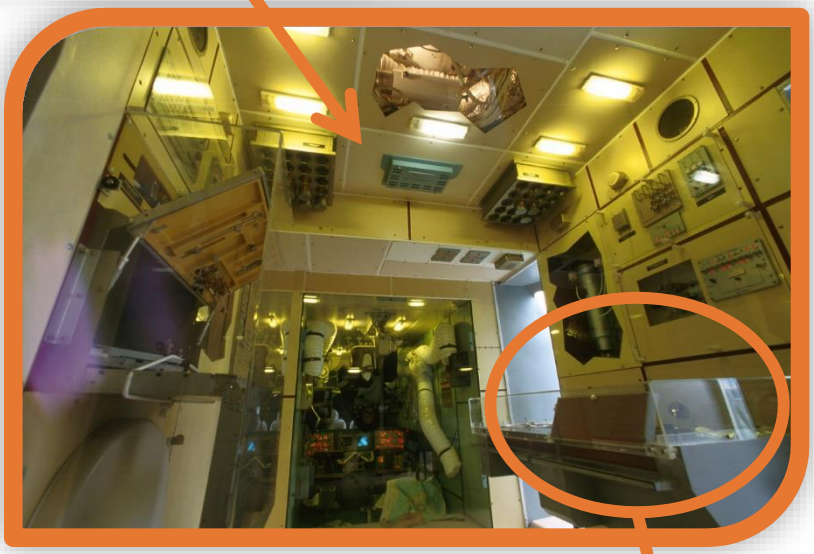
Can you find its name?

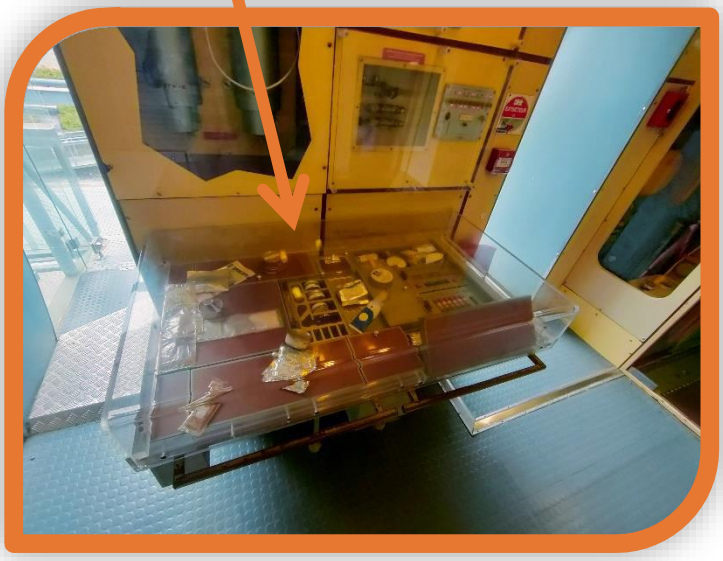
МИР = MIR”

Living area

(first module on the left upon entering from the ramp)







"Here we are in the astronauts' living area. **What rooms do you find in a house?"** Kitchen, bedroom, bathroom, etc.

"Where is the kitchen?"

“What does the food look like?”

“It is either in a tin or it’s dry powder in a packet. Either all the water has been removed (it has been 'dehydrated') or it has been put in a bag then all the air removed (this is called vacuum packing). Both methods are used to keep the food a long time without going off.”

“There’s no supermarket in space, and astronauts only get new supplies every 1 or 2 months. The tins and packets also take up less space and weigh less to carry.”

The astronauts sometimes have to rehydrate the food, like adding water to powdered soup.
There’s also a special oven to heat up the tinned food.

Experiment to be conducted in class

Drinking in space

Material (for each child)

- A zip-lock plastic bag
- A straw
- Some cocoa powder
- Some powdered milk
- Hot or cold water

Description

1. Put some of the cocoa and milk powder in the bag.
2. Fill it with water.
3. Shut the bag and knead it before shaking the mixture.
4. Adjust the quantities of powder and water to obtain a mixture liquid enough to drink.
5. Insert the straw then close the zip-lock around it.

Now drink!

“Astronauts must drink liquids from a pouch or use a straw. They can't pour water from a bottle into a glass.
Everything floats in space, so if they tried, droplets would float everywhere and they’d be difficult to catch and swallow.”

“Where are the toilets?” (On the left as you enter the space station).

“Astronauts don’t need a toilet seat because everything floats in space!
The toilets work like a vacuum cleaner so nothing escapes.

The hole in the middle is for collecting faeces and the yellow tube is for urine.”

“The urine is collected and purified/cleaned so the astronauts can drink it. Everything has to be recycled when you’re shut up in a space station for months at a time.”

“Where’s the bedroom?” (It is facing you when you enter MIR.)

“Where’s the bed?”
“It’s the sleeping bag attached to the wall. There is no need to lie down, but you need to be attached when you sleep because you’re floating. If you weren’t, you could find yourself at the other end of the space station!”

“What can you see in the astronaut’s bedroom?”
Photos, a computer, a Walkman (explain to the class that it’s the old music player before smartphones!)
Everything has to be attached with Velcro or it would float around.

I spy game

Place the children in front of the big display (see photo on the next page) and ask them to look for the following objects.

- a bike
- a camera
- a guitar
- a computer
- a soft toy

“The bike is on the ceiling, because there is no top and bottom in the space station. In space, because astronauts float, they don’t use their muscles much as they don't need to walk or go up stairs. To stay fit and healthy, they need to do at least 2 hours of sport a day.

In the space station, astronauts do scientific research. They study changes in the human body, plants, animals, materials etc. in space. They need a computer to record the information and a camera to take photos of their experiments and their life on board. Then they send them to Earth.”
(You can find numerous photos on the Instagram and Flickr accounts of Thomas Pesquet or the Flickr account named NASA Johnson)

“Astronauts also have some free time after their working day. They might enjoy playing a musical instrument for example, like the guitar.”


Soft toy
Bike
Camera
Computer
Guitar

In addition: The bathroom

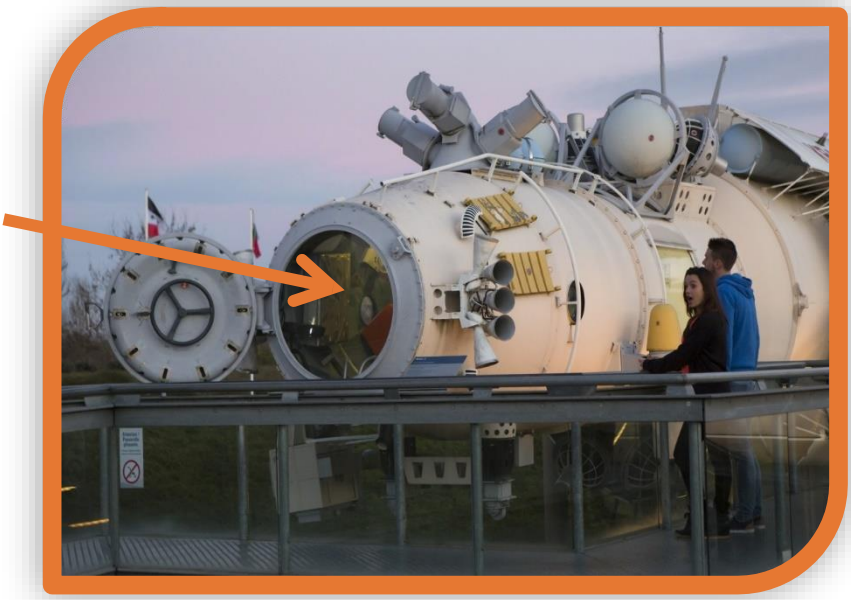
(On entering the last module you can visit) “**There’s one area of the house that we need to live but haven't seen yet. Which one? Can you see it nearby?**”

The bathroom with shower and sink.

“Astronauts have to wash themselves too. In the MIR space station, there was a shower and sink. Both were sealed shut so that water couldn’t escape.

Because water floats, it has to be expelled by a jet and then sucked in through a hole on the other side.”

In addition: Spacesuit



(At the end of the visit, you can look inside the airlock used by astronauts preparing to spacewalk). “**What can you see through the window?”**

An astronaut in a spacesuit. Astronauts need these when they go outside the space station.

The spacesuit keeps their body temperature within an acceptable range, because the temperatures in space are too hot or too cold for humans to survive.

Like a diving suit, it also provides the astronaut with oxygen to breathe, because there is no air in space.

In addition: Videos of astronauts' daily life

To finish your visit, take the stairs at the exit of the space station. They will bring you back to the MIR space station access point.

On the left of the central model, you will find an area where the children can watch a short video showing astronauts' daily life in space (eating, sleeping, washing, etc.)

"Being able to float in the space station like the astronauts is called being in weightlessness."

MIR, the Russian space station you visited, is no longer used and was destroyed in 2001. It was replaced by the International Space Station (ISS), operational since the 2000s. Since then, it has constantly hosted between 6 and 11 astronauts.

To remain in space, a space station must orbit, i.e. revolve around the Earth, at high speed (28,000 km/h, which is 35 times faster than an aircraft). It therefore passes through the Earth's shaded and sunlit areas 16 times a day.
It can sometimes be seen from Earth. To find out when the ISS will next pass in your night sky, see this website: https://www.seeiss.com/

Key points

- **A space station is a home in space for astronauts where they also work.**
- **It has different areas and facilities for eating and drinking, going to the toilet, sleeping, enjoying free time after work, etc.**
- **Some activities are different from on Earth because everything floats in space.**