

MISSION X

TRAIN LIKE A PARASTRONAUT



Para swimming

In 2022, British surgeon John McFall, whose right leg was amputated after a serious motorbike accident, became the first disabled person to join ESA's new class of astronauts. He is now part of an unprecedented programme to study the "feasibility" of spaceflight access for "parastronauts". John McFall is also a former parasport world sprint champion over 100 and 200 metres, in 2007, before winning a bronze medal at the Beijing Paralympic Games the following year!

The 17th Paralympic Games took place from 28 August to 8 September 2024 in France. During these games, 23 different sporting disciplines were represented, including para swimming.

The astronauts also train in giant pools in which a model of part of the International Space Station (ISS) is immersed. This environment is the one that best enables astronauts to get close to an extravehicular spacewalk situation, even if it is not a true weightlessness situation. Would it be possible to incorporate it into training for a disabled astronaut?

Are you ready to take on this challenge like a parastronaut?



Sophie Adenot training in the swimming pool © ESA

MISSION DESCRIPTION

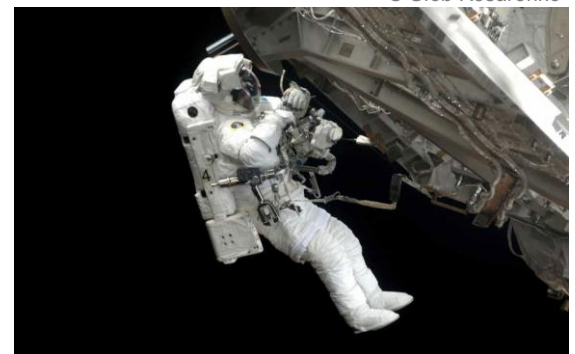
During their spacewalks outside the space station, the astronauts find themselves in the vacuum of space, attached to the station only by their hands and a safety cable. With their cumbersome spacesuits that allow them to breathe in space, their movements are severely restricted and they move slowly along the walls of the station by pulling with their arms. Before boarding the station, the astronauts train in huge swimming pools.

Swimming is also one of the events at the Paralympic Games. All disabilities can be represented in these events, which are the same as for the Olympic Games.

Your mission will consist in learning how to move around when you leave the space station. To do this, you have to cross the pool without using your legs.



© Gleb Kosarenko



Spacewalk by Thomas Pesquet in 2021 © ESA

SKILLS WORKED ON

- Developing motor skills and building a body language
- Acquiring methods and tools for learning, individually or in groups, through practical experience
- Abiding by the same rules, taking on roles and responsibilities to learn to live together
- Learning how to maintain one's health through regular physical activity
- Adopting a physical, sporting and artistic culture

MISSION PREPARATION

- Plan a trip to the swimming pool.
- Children can do the activity with floating armbands or belts, cylindrical floats, floating boards.
- It might be best to exclude certain aides (inner tubes, cylindrical floats, etc.).

WARM-UP

Rotate arms forward and then backward 10 times.
Cover 5m twice in the water, using only arms and/or walking.

MISSION SEQUENCE

Contextualise the route by imagining that the children are future astronauts on a training mission to learn how to go into space to maintain and repair certain parts of their spaceship!

Children can move freely around in the pool but without swimming or using their legs.
They can use whatever they like: the edges, lane separators, floating equipment, etc.
Once the children are relaxed in the water, it is possible to design more difficult routes with tasks to be completed at different stages or to compete in a race or relay to see who can cross the pool the fastest.
The exercise can be done in pairs if some children need assistance.

Point out to the children that their performance improves with practice and that they can then gradually increase the difficulty and/or intensity of the activity.

EXAMPLES OF POSSIBLE ADAPTATIONS

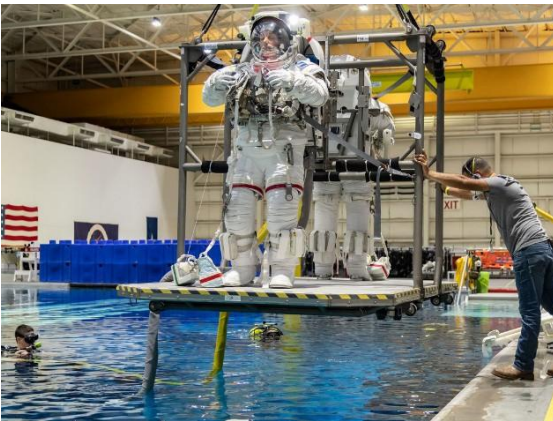
Increase the difficulty and/or intensity:

- Reduce the distance to be covered.
- Attach small weights to the ankles and/or wrists to simulate the cumbersome spacesuit.
- Use only one arm to move around.

Reduce the difficulty and/or intensity:

- Reduce the distance to be covered, simplify the route.
- Attach floats to the legs and/or arms.
- Stay in areas where children can touch the bottom with their feet.
- Use more obvious visual cues and/or sound cues.

DID YOU KNOW?



Thomas Pesquet training in a swimming pool © NASA, ESA

The suit used, specifically developed for training astronauts in swimming pools, enables the buoyancy of the whole body to be controlled. It is not unusual for astronauts to spend up to 6 hours in their spacesuits at a depth of 12 meters.

The spacesuits used to go into space can weigh from 80 to over 100kg! They're like a mini spaceship, enabling astronauts to breathe oxygen and evacuate the CO₂ they release, maintain a stable internal pressure, have a water reserve and evacuate their own liquids, have a temperature regulation system to combat the rapid day/night temperature variations in orbit around the Earth (from -100°C to +120°C in space!), protect themselves from solar radiation, radiation and micrometeorites or debris, and communicate, all for an autonomy of up to 7 hours, while retaining sufficient mobility to carry out the tasks assigned to them. A remarkable concentration of technology!