Wheelchair para sports

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 Para sport 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 the games, 23 different sporting disciplines were represented, including wheelchair basketball, wheelchair rugby and wheelchair tennis.

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In the International Space Station, due to microgravity, astronauts float and no longer need to use their legs to move around. We can imagine that such an environment could make it easier for a parastronaut to get around, given certain adaptations and a bit of training.

Are you ready to take on this challenge?

MISSION DESCRIPTION

Physical training is part of everyday life for astronauts aboard the space station, as it is for Paralympic athletes. Because astronauts are weightless in the station, they have to do at least two and a half hours of sport a day to prevent their muscles from atrophying. They also undergo extensive physical and mental preparation before lifting off for the station. As for parathletes practising an armchair sport, they need to have very strong arms and excellent coordination to move quickly around the field while playing precisely.

Today, you'll be taking part in a simulation in which you'll have to make your way through the space station as quickly as possible in order to repair a technical problem, all the while putting yourself in the shoes of a parastronaut.

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

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MISSION PREPARATION

- Choose a large, flat, smooth area.
- Three wheelchairs are required.
- Provide 60 cones and 27 rings.
- Divide the children into 3 mixed and balanced teams.

WARM-UP

10 rotations of the wrists in one direction then the other.
Rotate arms forward and then backward 10 times.
Move 10m in a straight line in a wheelchair.

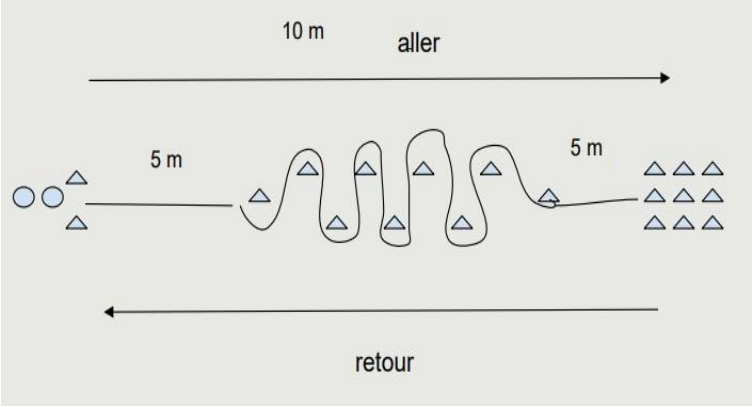
MISSION SEQUENCE

Contextualise the journey by having the children imagine that they are future astronauts on a training mission to learn how to move quickly in zero gravity in the space station in order to fetch parts to repair a fault that has occurred in the spaceship!

Each team has to place all its rings on the cones on the other side of the course, using their wheelchair. The children take it in turns to complete the course in relays (free return). When a child completes the course, they hand the chair to their partner.
The event is timed and the clock stops only when all 3 teams have finished. To improve the overall group time, get the children to think about the best possible strategies and ways of working together.

NB: The course can also be run in pairs to help a friend with special needs.

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.



DID YOU KNOW?

Return to Earth after Thomas Pesquet's Alpha mission
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During spaceflight, or in simulated weightless conditions such as prolonged bed rest, the body's skeletal muscles undergo atrophy, which can be particularly severe for the muscles of the lower limbs. This atrophy results in corresponding losses of mass and strength, as well as the disappearance or transformation of part of the muscle proteins.
The conditions of space missions also lead to bone loss, which in humans is restored after six months on the ground, a period equivalent to the duration of an astronaut's mission.

The studies carried out on these phenomena in the context of crewed spaceflight are also helping us to understand and treat similar disorders on Earth.
In the case of astronauts, strategies involving medication and dietary supplements can be combined with physical exercise programmes to counteract these bone and muscle losses.