UK SPACE AGENCY

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MISSION X

TRAIN LIKE AN ASTRONAUT

DO A SPACEWALK!

Team Leader Guide

MISSION OVERVIEW

Students will perform the "bear crawl" and "crab walk" to increase muscular strength and improve upper and lower body coordination.

FAST FACTS

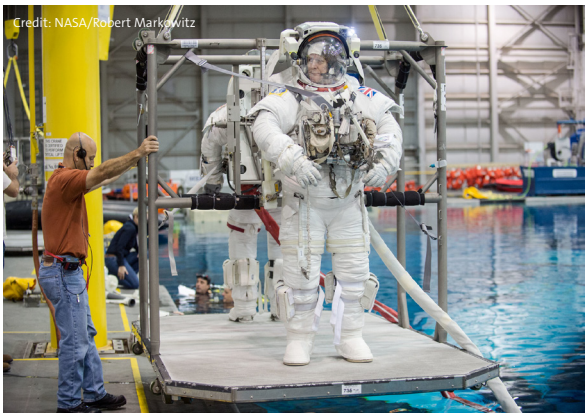
Subject: Physical Education
Age: 8-12
Lesson Time: 25 min
Location: a smooth, flat, and dry surface, at least 12 m in length

LEARNING OBJECTIVES:

- Increase muscular strength and improve upper and lower body coordination.
- Make and record observations about improvements in muscular strength and upper and lower body coordination.

Skills: mobility, dexterity, flexibility, motor skills.

INTRODUCTION



↑ ESA astronaut Timothy Peake in preparation for a spacewalk training session at the Neutral Buoyancy Laboratory (NBL) near NASA's Johnson Space Center.

In space, astronauts must be able to perform physical tasks that require muscle strength and coordination. One task that certain astronauts must be able to complete is an Extra Vehicular Activity (EVA), or spacewalk. Spacewalks allow a crew member to examine the outside of space vehicles, like the International Space Station, and make repairs or modifications to the vehicle if necessary.

Although safely tethered to the space vehicle, the conditions under which a spacewalk is completed can be long and strenuous for the crew member. An astronaut must manipulate his or her fingers within large, thick gloves – sometimes for hours at a time. A spacewalk also involves coordinating arm and leg movements to move around, or "translate". On Earth, astronauts prepare for EVAs by practising these strenuous tasks and movements underwater. By training on Earth, crew members learn to rely on their upper body strength and coordination to pull and secure themselves close to the vehicle and to complete their assigned tasks in space. On Earth, muscle strength and coordination are important to being physically fit and help us perform a variety of everyday tasks. An increase in muscular strength and coordination can be developed by practising exercises such as the "bear crawl" and the "crab walk".

LET'S TRAIN LIKE AN ASTRONAUT!

MATERIALS

Team Leader
- Tape measure or meter stick.
- Watch or stopwatch.

Student
- Mission Journal and pencil.

Optional to be used in Mission Adaptations
- Rope/jump rope.
- Reach grippers.

PROCEDURE

Bear Crawl

Students get down on their hands and feet (facing the floor) and walk on all fours like a bear.

- Students must try to travel the measured distance.
- Rest for 2 minutes.
- Repeat this 2 times.

Crab Walk

Reverse Bear Crawl. Students must sit on the ground and put their arms and hands behind them, knees bent and feet on the floor. From here, students can lift themselves off the ground (facing upwards).

- Students must try to travel the measured distance.
- Rest for 2 minutes.
- Repeat this 2 times.

SET-UP

Students should stand at least 2 arms lengths apart from one another.

THINK SAFETY

- The traveled surface should be smooth, flat, and dry as students will be placing their hands on the floor.
- Proper distance between students will ensure safety for hands and feet and will help prevent collisions.
- Proper hydration is important before, during, and after any physical activity.
- Be aware of the signs of overheating.
- A warm-up/stretching and cool-down period is always recommended.

MISSION ADAPTATIONS

Increase Diffculty

- Increase the distance to do the activity.
- Students can wear hand and ankle weights.
- Students do the activity backwards.
- Set up a course for the students to travel through.
- Students perform the activity as a relay team.

Increase Accessibility

- Let the student self-propel a wheelchair/ walker.
- Permit a partner to push/assist a student in a wheelchair or with walker to use hand over hand assistance.
- Use a jump rope to pull the body through space.
- Include extensions/reach grippers to assist students with limited range of motion or limb strength. Use sound emitting items like a bell, beeper ball along the travel distance.

Decrease Difficulty

- Decrease the distance to do the activity.
- Put signs on the ground where to put hands for each step forward.
- Provide a sentence or visual picture/physical demonstration for students to follow when completing the activity.

This resource has been adapted from NASA's "Do a Spacewalk".
Original Credits: Lesson development by the NASA Johnson Space Center Human Research Program Education and Outreach team with thanks to the subject matter experts who contributed their time and knowledge to this NASA Fit Explorer project.