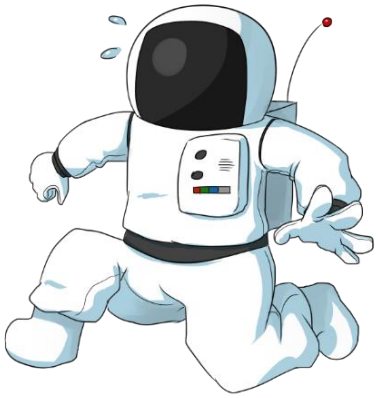
Astronaut Training: Exercise Challenge

HOW DO ASTRONAUTS TRAIN TO GET READY TO GO TO OUTER SPACE? DO YOU HAVE WHAT IT TAKES?

A big part of becoming an astronaut is staying physically fit and healthy! Over the next 5 days, complete all the exercise challenges listed in the guide (page 2-3) and track your performance (page 4) to see how astronauts keep in shape. Then, at the end of the week, think about why this type of training would be helpful to astronauts and answer the questions in your performance log!



WHY *DO* ASTRONAUTS NEED TO EXERCISE?

Traveling to outer space is a challenge not only for the mind, but for the body as well. The effects of zero gravity can be hard on astronaut's bodies, so they need to physically train here on Earth, and once they're in space too.

STRENGTH - Astronauts need to practice **strength** training to keep their muscles and bones strong and working. Here on Earth, **gravity** is constantly exerting a force on our muscles. In outer space, however, there is no gravity. This causes muscles to weaken and deteriorate over time. On the **International Space Station (ISS)**, astronauts do strength training for at least an hour every day to prevent their muscles from breaking down.

BALANCE - Astronauts also practice their **balance** while they're in space missions. Here on Earth, special fluids that keep us balanced in our heads are controlled by the forces of **gravity**. In space, those fluids are free to float around. This causes astronauts to experience dizziness, lack of spatial awareness, and difficulty balancing. On the **ISS**, astronauts practice coordinated movements to adjust their brains and bodies to the new conditions. When they return, they must repeat the process to adjust back to Earth's gravity.

CARDIO - Lastly, astronauts must train for **cardio and endurance** to keep their heart and lung muscles strong. Here on Earth, these muscles are constantly working to pump blood and air throughout our bodies against the *additional* forces of **gravity**. With reduced gravity in space, those muscles don't have to work as hard and can weaken over time. This puts astronauts at risk of returning to Earth with a weak heart. On the **ISS**, astronauts do cardio training for at least an hour every day to prevent their heart and lung muscles from weakening.

SUGGESTED MATERIALS

- Training guide (pages 2-3)
- Performance log (page 4)
- Open Space
- Water
- Jump Rope (if available)
- Small, soft ball
- Yoga mat or padded surface
- 8 cones (if available – bean bags or stuffed animals also work)

SAFETY

Always listen to your body! Make sure you are taking breaks, drinking water, and stretching before and after these challenges!

JOIN OUR CREW

After completing the challenge, let us know by tagging @chabotspace or using the hashtag #LearningLaunchpad

Visit NASA's website for **more** Astronaut Training activities!

DAY 1: JUMP ROPE CARDIO CHALLENGE

THE CHALLENGE

- Grab a jump rope, real or imaginary!
- Use it to jump in place for 30-60 seconds.
- Rest 60 seconds
- Repeat 3 times.

Strengthen your **heart** and **lung** muscles!

BONUS

- Try adding movement forward or backwards while jumping!
- Jump with movement for 30-60 seconds.
- Rest 60 seconds.
- Repeat 3 times

REPEAT THIS CHALLENGE 3 TIMES THROUGH

DAY 2: BALL AND BALANCE CHALLENGE

THE CHALLENGE

- Grab a soft ball and an open wall!
- While balancing on one leg, throw the ball against the wall and catch it as it bounces back.
- Count your successful catches in 60 seconds.
- Rest 60 seconds.
- Repeat with the other leg.

Train your **coordination** and **spatial awareness**!

BONUS

- Bounce the ball on the floor instead.
- Count how many bounces you can make in 60 seconds.
- Rest 60 seconds.
- Repeat with the other leg.

REPEAT THIS CHALLENGE 3 TIMES THROUGH

DAY 3: BEAR CRAWL STRENGTH CHALLENGE

THE CHALLENGE

- Get down on your hands and feet, like a bear. Crawl forward and backward across the floor.
- Do this for 60 seconds.
- Rest 60 seconds.
- Repeat 3 times.

Strengthen your **muscles** and **bones**!

BONUS

- Try crawling back and forth sideways! Or reverse your body to do a crab walk.
- Do this for 60 seconds.
- Rest 60 seconds.
- Repeat 3 times.

REPEAT THIS CHALLENGE 3 TIMES THROUGH

DAY 4: SOMERSAULT BALANCE CHALLENGE

THE CHALLENGE

- Squat into a ball, chin to chest and hands to floor. Gently roll forward into a somersault, finish sitting.
- Do this 3-5 times, slowly!
- Rest 2 minutes.
- Repeat 3 times.

Build your **coordination** and **flexibility**!

BONUS

- Try to finish in a standing position in one, fluid motion.
- Do this 3-5 times, slowly!
- Rest 2 minutes.
- Repeat 3 times.

REPEAT THIS CHALLENGE 2 TIMES THROUGH

DAY 5: AGILITY COURSE COMBO CHALLENGE

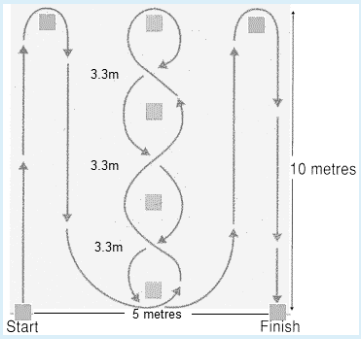
THE CHALLENGE

- Place 8 objects on the floor in the pattern pictured below… This is the course.
- Time how long it takes to run the course once.
- Rest 60 seconds.
- Repeat 3 times.

Test your **speed, strength,** *and* **balance**!

BONUS

- Increase the distance between objects in the path. Or add more objects!
- Time how long it takes to run the course now.
- Rest 60 seconds.
- Repeat 3 times.



REPEAT THIS CHALLENGE 3 TIMES THROUGH

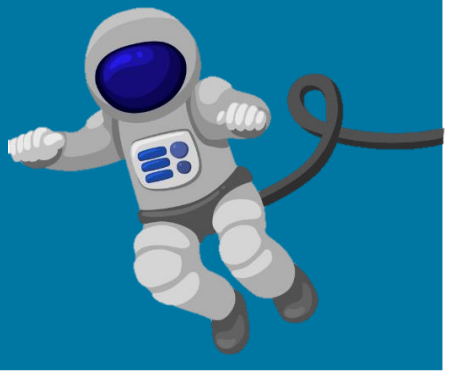
CONGRATULATIONS, CREW!

YOU HAVE COMPLETED THE ASTRONAUT EXERCISE CHALLENGE!

Share your training with @chabotspace and the #LearningLaunchpad!

WANT TO KEEP TRAINING?

Repeat this entire 5-day challenge two more times! Compare results from week to week to improvements. Can you get faster, stronger, or more balanced? Astronauts train for years before heading to space, so get to it! Find **more** Astronaut Training activities on NASA's website!



EXERCISE CHALLENGE: PERFORMANCE LOG

DAY 1

How many **cycles** of **jump rope** were you able to complete before getting tired? _____

Were you able to add in **movement**? Was it easy or hard?

DAY 2

How many **catches** were you able to successfully make before **losing balance**? _____

Was it **easier** or **harder** to bounce it on the **floor**? **Why** do you think that is?

DAY 3

How many cycles were you able to **crawl** before getting tired? _____

Did you try crawling **sideways**? Or **crabwalk**? How did that **compare**?

DAY 4

How many **somersaults** were you bale to do before getting dizzy? _____

Were you able to **finish standing**? Was it **more** or **less challenging**?

DAY 5

How **quickly** were you able to **complete** the course? _____

If you added **extra cones** or **increased distance**: was it **more** or **less challenging**?

WHY DO YOU THINK ASTRONAUTS NEED TO BUILD THEIR STRENGTH?

WHY DO YOU THINK ASTRONAUTS NEED TO PRACTICE THEIR BALANCE?

WHY DO YOU THINK ASTRONAUTS NEED TO HAVE STRONG CARDIOVASCULAR MUSCLES?

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