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.

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

Strengthen your heart and lung muscles!

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.

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

Train your coordination and spatial awareness!

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.

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

Strengthen your muscles and bones!
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.

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.

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 @chobotspace 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 able 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?