

Topic: Body Changes during Spaceflight

Teacher Information

Time Allowance

30-40 min.

Background

When astronauts leave Earth's gravity, they experience a puffy head and bird legs. With the rush of fluids to the upper part of the body that occurs in free fall, the heart has more blood to force out during each beat. To compensate for this increase in volume, the heart rate decreases. To simulate the fluid shift here on Earth, scientists use the bed rest head-down tilt method. Some studies of this type last only 24 hours, but others have lasted up to about a year.

Objective

To simulate the fluids shift in astronauts and notice the change in heart rates.

Materials

tape measure
pillows and a chair
paper and pencil
watch with a second hand

Topic: Puffy Heads and Bird Legs

Student Information

Background

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Procedure

1. While your partner is standing, measure and record the leg size on the lower part of his/her leg. Record this information on the data log.
2. Measure your partner's standing heart rate (beats per minute.) Record this information on the data log.
3. Ask your partner to lie down on the pillows with his legs pointing upward, supported by a chair. Place only one pillow under his head and three or four pillows under the back to provide a tilt.
4. Every minute for 10 minutes measure and record leg size on the data log. Be sure to measure at the same place each time.
5. Every 2 minutes find the resting heart rate in the head-down tilt position.
6. Record observations of changes in the face. Also, write down the person's feelings during the 10 minutes.
7. After the 10 minutes, ask your partner to stand up slowly and carefully. Lowering the legs and then sitting for a short period is recommended.

Now it's your turn!



Topic: Puffy Heads and Bird Legs!

Data Log

Name of Astronaut Being Tested: _____

Standing Heart Rate: _____

Minute	Pulse	Measurement	Observation
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

Name of Astronaut Being Tested: _____

Standing Heart Rate: _____

Minute	Pulse	Measurement	Observation
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			