

Questions to Ask

What is your exercise plan for yourself?
Are you following it?

If you have a pet, what is your exercise program for the pet? Are you helping the pet to follow it?

Space Flight Effect on Bones

In space, astronauts do not experience the effects of gravity like we do here on earth. They float, so there is no weight bearing on their bodies. While in space an astronaut is at very high risk for losing substantial bone mass.



The Veterinary Black Bag Program

Project Goals:

- Develop Veterinarian’s Black Bags (VBBs) of instructional items and pamphlets for middle school teachers to support classroom visits by local veterinarians.
- Provide professional development for veterinarians and teachers on how to use items in the VBBs.
- Promote inquiry-based thinking about health-related subjects while emphasizing the value of biomedical research and promoting careers in science.



PEER

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<http://peer.tamu.edu/VBB/Summary.asp>

Exercise and Bones

Follow Up Lesson



**The instruction in this module includes:
Presentation on *Orthopedics***

Follow-up lessons on:

Nutrition and Bone

Exercise and Bone

Bone Experiment Design

Summary of Lesson Content

Objectives

Students will:

1. Explain how exercise affects bone development and remodeling.
2. Learn about how exercise affects bone disorders.
3. Compare pet's exercise regimen to own exercise regimen.

The lesson begins with a presentation of Wolf's Law and a description of how bone remodels in response to physical stressors. Bone densities of the following are compared: athletes, the elderly, and astronauts who have been in low-gravity environments for long times.

The lesson also includes exercise recommendations and a video of a dog exercising in a water tank.

This lesson explains how and why bones are dynamic structures, responding to diet, age, and mechanical forces. Special implications are presented for children, athletes, astronauts, and the elderly.



Vocabulary

Osteoblasts – cell that secrete the matrix made up of calcium phosphate crystals.

Osteocytes – the osteoblasts; trapped within bony wall that they have deposited around themselves.

Osteoclasts – cells that break down bone by releasing acids to dissolve crystals and enzymes to break down matrix.

