

HS Anatomy and Physiology WoLakota Lesson Plan – February 24

- Life Science 9-12 Indicator 1: Understand the fundamental structures, functions, classifications, and mechanisms found in living things.
- 9-12.L.1.2A: Students are able to describe how living systems use biofeedback mechanisms to maintain homeostasis. Examples: endocrine, nervous, immune
- OSEU2.2.9-12: Students are able to evaluate the importance of spiritual, physical, social and emotional health.

Introduction: Share the “Big Bang Theory” clip where Sheldon explains homeostasis.

<https://www.youtube.com/watch?v=9RLnIXNlfdk> Have students share what they have learned so far about homeostasis and body systems to establish common knowledge with the group.

Lesson: Share this video which explains how homeostasis works in our bodies:

<https://www.youtube.com/watch?v=XZxuQo3yIII> another one that is simpler:

https://www.youtube.com/watch?v=d2YWonZsh_M

Engage students in the following activity to experience negative feedback:

1. Tell students another good example of the body maintaining homeostasis happens when we exercise. As our respiration increases during exercise, our bodies respond by increasing our breathing and heart rate to remove the extra carbon dioxide we are producing and increase the amount of oxygen. When we are finished exercising, the body will work to normalize our breathing and heart rate. Explain to students that the negative feedback mechanism in our body is responsible for normalizing breathing and heart rate after exercise.
2. Ask students to take their pulse for 15 seconds. They can multiply this number by 4 to get their resting pulse rate at 1 minute.
3. Next, ask students what they think will happen to their pulse rate after they do jumping jacks for one minute. Ask for predictions for how much they believe their pulse rate will increase. Then ask students to stand up, spread out, and do jumping jacks for 1 minute.
4. Immediately after the exercise, ask students to again take their pulse for 15 seconds. Students can again take this number and multiply it by 4 to get their pulse rate at 1 minute. How much did their pulse rate increase?
5. Ask the class to predict how long it will take their pulse rate to return to the resting pulse rate they first measured. Have students take their pulse rate after 2 minutes, 3 minutes, etc. until it returns to their resting pulse rate.
6. A third example of homeostasis in the body can be illustrated by watching the eyes for pupil reactions to different lighting situations. Divide students into small groups to try experimenting with a flashlight. Ask for volunteers within the small groups to briefly shine a flashlight at their eyes. The other students should observe what happens to the volunteer’s pupils. How quickly do the pupils dilate? How quickly do they return to a normal size? Depending on your class, it may be better to try turning the lights on and off in your classroom and have the students observe each other’s eyes for changes in their pupils.

Connect homeostasis to the Anderson Cooper video which shows how we can control our bodies’ reactions to stressors.

<https://www.youtube.com/watch?v=HbLVTZuTdmQ>

Talk about homeostasis as seen through the Lakota Medicine Wheel. Keeping balance has always been a part of the Lakota culture. The Medicine Wheel is the symbolic representation for balance in life. Share the Ron Warne video.

Have students apply this concept of balance to their personal lives using the image of the Medicine Wheel and the reflective questions, and then close with music and quiet reflection.



The Native American medicine wheel is a sacred symbol used by indigenous Plains tribes to represent all knowledge of the universe.

Circle - The circle represents the sacred outer boundary of the Earth often referred to as the Sun Dance Circle or the Sacred Hoop. It represents the continuous pattern of on-going life and death.

Lines - The horizontal and vertical lines represent the sun and man's sacred paths; the crossing of the two lines indicates the center of the Earth where one stands when praying.

Feather - The eagle feather is a sign of Wakan Tanka's - the Great Spirit's - power over everything.



Directions

East ~ Color: Yellow, Messenger: Brown Eagle, Associated with the sun, brings light to all creation. Because the sun travels east to west, in a clockwise manner, all good things conform to the same pattern. The Morning Star, the star of wisdom and new beginnings, comes from the east. Elk people call the east home.

South ~ Color: Red, Messenger: Crane, Associated with warmth, happiness, and generosity. Connected with life after death, directs men as they walk toward the next phase. Life begins in the south. Nourishment of every kind comes from this direction. Home to the animal people.

West ~ Color: Black, Messenger: Black Eagle, Connected with the power of rain and the purity of water; joy and growth follow the rain, releasing the ignorance. West is home to the Thunder-being. His wings produce thunder and lightning flashes from his eyes. The bird-like being stands against evil and ensures the respect of others.

North ~ Color: White, Messenger: Bald Eagle, North is home to winter and is believed to promote good health and growth. Those who misbehave look to the north for the wisdom needed to walk a straight path again. Home to the Calf Pipe Woman and buffalo people.

