How's Your Heart?

Expedition Link: Physiology – The team will study how the human organism reacts to changes in physical environment. Particularly, they will acquire measurements and comment on how working and sleeping at high altitudes in extreme conditions affects mission operations. Health metrics, such as blood saturation and pulse rate, will be monitored for each of the team members throughout the course of the expedition.

Procedure:

The students will measure their heart rate and explore conditions that can affect it. They'll explore the affects of various physical activities on their heart rate.

A. Have the students locate their pulse points on their neck by placing their index finger beneath the ear and jawbone. To locate their pulse on their wrist have the students place their right index and middle finger on the palm side of their left wrist.

B. Have the students count the number of beats in 15 seconds. Multiply this by four (15 x 4 = 60). This is how many times the heart beats in one minute. Have students enter this as their "at rest" heart rate on their record sheet. (Student pulse rate at rest will vary between 60 - 110 beats per minute.)

C. Have the students exercise such as running in place, pushups, or some other exercise for one minute. Have them stop and calculate their pulse rate again for 15 seconds. The students need to calculate their heart rate for each physical activity and indicate this on their record sheet.

D. Have the students compare the heart rates of students in their class. Have them find the average heart rate of all the students.

1. For homework have the students collect pulse rates from adults and record this on another record sheet. Have the class find the average heart rate for their parents. Compare their heartbeats with the student's average heart rate.
2. The amount of time the heart takes to return to a normal at-rest rate after exercise is called **recovery time**. This is a measure of the body's general fitness. The shorter the recovery time, the higher the level of fitness. Have the students determine their recovery rate by first measuring and recording their pulse rate at rest. Then, have them run in place for 5 minutes and record their pulse rate every minute until the at-rest rate is reached. They need to record the time it took for their heart to return to the normal rate.

Acknowledgments: Adapted for Science Days from www.extremeenvironment.com

Student Name _____

"How's Your Heart" Student - Student Record Sheet

At Rest Heart Beat for two minutes

(Number of Beats in 15 seconds x 4) _____ beats per minute

Class Average Beats per minute _____

(Name of Physical Activity)_____ for two minutes

(Number of Beats in 15 seconds x 4) _____ beats per minute

Class Average Beats per minute _____

(Name of Physical Activity)_____ for two minutes

(Number of Beats in 15 seconds x 4) _____ beats per minute

Class Average Beats per minute _____

(Name of Physical Activity)_____ for two minutes

(Number of Beats in 15 seconds x 4) _____beats per minute

Class Average Beats per minute _____

SYNTHESIS of DATA

Compare the results of the student data with the results of the class data.

At Rest Heart Beat:	My Data _____	Class Average _____
_____ for two minutes	My Data _____	Class Average _____
_____ for two minutes	My Data _____	Class Average _____
_____ for two minutes	My Data _____	Class Average _____

Conclusions: Compare the data from each test. What do you conclude? Use the back of this page if you need more space.

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