Name: _____ **Date:** _____

Muscles, Molecules, and Movement: Midnight Marathon Mystery of 8th Grade

Moving beyond simple heart rates to analyze metabolic thresholds and cellular adaptations during high-intensity interval training and endurance cycles.

---

1. An 8th-grade soccer player notices they can sprint faster for longer after a month of hill training. This long-term change in the body's efficiency is known as:

A. An acute response
B. A chronic adaptation
C. Homeostatic imbalance
D. The fight-or-flight reflex

2. During a 30-second 'all-out' burst on a stationary bike, the body primarily relies on the _____ pathway to create energy without using immediate oxygen.

A. Aerobic respiration
B. Beta-oxidation
C. Anaerobic glycolysis
D. Parasympathetic

3. Hypertrophy refers to the increase in the size of skeletal muscle fibers as a chronic adaptation to resistance training.

A. True
B. False

4. Which of these is considered an 'acute response' to a single bout of vigorous swimming?

A. Increased bone density
B. Lower resting heart rate
C. Vasodilation of blood vessels
D. Increased red blood cell count

5. The _____ volume is the amount of blood the heart pumps out of the left ventricle with every single beat.

A. Cardiac
B. Tidal
C. Stroke
D. Residual

6. Delayed Onset Muscle Soreness (DOMS) is primarily caused by a buildup of lactic acid in the muscles 48 hours after exercise.

A. True
B. False

Name: _____ Date: _____

7. If an athlete is performing a low-intensity, long-distance hike, which fuel source is their body most likely to prioritize for the aerobic system?

A. Creatine phosphate
B. Lipids (Fats)
C. Lactic acid
D. Amino acids

8. The concept of _____ state refers to the point during exercise when oxygen uptake remains constant because it meets the energy demands of the activity.

A. Steady
B. Peak
C. Anaerobic
D. Depletion

9. Why does a 'cool-down' period help prevent fainting after intense exercise?

A. It stops the production of sweat instantly
B. It prevents blood from pooling in the lower extremities
C. It increases the oxygen debt of the brain
D. It raises the blood pressure rapidly

10. Mitochondria increase in number and size as a chronic adaptation to regular aerobic endurance training.

A. True
B. False