

Name: _____ **Date:** _____

Pizza Parties vs. Power Sprints: 4th Grade Exercise Science Fun

Develop a deep understanding of energy systems and muscle recovery by solving 10 advanced physiological challenges based on real-world athletic scenarios.

1. Imagine you are a soccer goalie. You suddenly dive to catch a ball. Which energy system is primarily responsible for that split-second, explosive movement?

- A. The Aerobic System (using oxygen)
- B. The ATP-PC System (quick energy stores)
- C. The Digestive System (breaking down lunch)
- D. The Respiratory System (breathing patterns)

2. After weeks of practicing long-distance swimming, your heart becomes a more efficient pump. This long-term change in your body is known as a _____ response.

- A. Acute
- B. Temporary
- C. Chronic
- D. Rapid

3. True or False: During a vigorous game of tag, your breathing rate increases because your muscles require more carbon dioxide to keep moving.

- A. True
- B. False

4. If an athlete's resting heart rate drops from 80 beats per minute to 65 beats per minute after a year of training, what has likely happened to their 'Stroke Volume'?

- A. It decreased, so the heart pumps less blood
- B. It stayed the same because heart rate is unrelated
- C. It increased, meaning the heart pumps more blood per beat
- D. It vanished, allowing the heart to rest longer

5. When you perform a 'wall sit' in PE class and your legs start to feel a 'burning' sensation, your body is likely producing _____ as it breaks down glucose for energy without enough oxygen.

- A. Adrenaline
- B. Lactic acid
- C. White blood cells
- D. Saliva

6. True or False: Hypertrophy refers to the process where muscle fibers grow larger in response to resistance training, such as lifting heavy objects.

- A. True

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B. False

7. Which of these is an example of an 'Acute Response' to exercise that you would notice within the first 60 seconds of a race?

- A. Increased bone density
- B. Vasodilation (widening of blood vessels)
- C. Growth of new capillaries
- D. A permanent change in personality

8. To repair 'microtears' in your muscles after a tough workout, your body initiates a process called protein _____ to build the tissue back stronger.

- A. Decomposition
- B. Hydration
- C. Synthesis
- D. Circulation

9. Why is a 'cool-down' like walking slowly after a hard run important for your circulatory system?

- A. It helps blood return to the heart rather than 'pooling' in the legs
- B. It stops the heart from beating entirely
- C. It prevents the body from ever getting tired again
- D. It turns lactic acid into vitamins

10. True or False: The Aerobic system is the primary energy source used when you are sitting quietly at your desk or taking a long, slow walk.

- A. True
- B. False