

Name \_\_\_\_\_

## Nephrons: The Kidney's Filtering Units

### Open-Ended Response Answer Key

1. If nephrons are not filtering blood effectively, waste products and excess substances may not be adequately removed from the bloodstream. This can result in the presence of toxins and waste in the body, leading to health problems such as kidney disease, electrolyte imbalances, and an increased risk of cardiovascular issues due to elevated waste levels in the bloodstream.
2. In dehydration, nephrons reabsorb more water from the urine to conserve it and prevent further fluid loss. This helps maintain the body's water balance by reducing urine output and conserving precious fluids. Nephrons are vital in this process to ensure the body remains hydrated and functions properly.
3. Nephrons play a crucial role in regulating electrolytes like sodium and potassium by selectively reabsorbing or excreting them as needed. If nephrons fail to maintain this balance, it can lead to electrolyte imbalances, which may cause muscle weakness, nerve dysfunction, and even life-threatening conditions such as cardiac arrhythmias. Maintaining the proper balance of electrolytes is essential for overall health.
4. If nephrons cannot effectively excrete excess hydrogen ions, it can lead to metabolic acidosis, a condition characterized by increased blood acidity. This can result in symptoms such as muscle weakness, confusion, and breathing difficulties. Over time, it can also lead to the development of kidney stones, bone problems, and other complications if left untreated. Proper nephron function is crucial for maintaining the body's acid-base balance and overall health.

