

Name \_\_\_\_\_

## The Marvelous Kidneys: Blood Filtration and Urine Production

### Open-Ended Response Answer Key

1. If the glomeruli are not functioning correctly, blood filtration is impaired, leading to reduced urine production and the accumulation of waste products and excess substances in the bloodstream. This can result in health issues such as fluid retention, electrolyte imbalances, and the buildup of toxic waste products, potentially leading to kidney disease and other related complications.
2. When a person is severely dehydrated, the kidneys respond by producing concentrated urine with less water to conserve fluid. This helps prevent further fluid loss and dehydration. By reducing urine output and reabsorbing more water into the bloodstream, the kidneys play a crucial role in maintaining the body's internal balance and preventing extreme dehydration.
3. Urine is a valuable diagnostic tool in healthcare because it can provide essential clues about a person's health. Changes in urine color, odor, or composition can indicate various medical conditions. For example, dark urine may suggest dehydration, while sweet-smelling urine can be a sign of diabetes. Cloudy urine might indicate a urinary tract infection. By analyzing urine, healthcare professionals can make informed diagnoses and develop appropriate treatment plans for their patients.
4. If a person's kidneys cannot reabsorb essential substances efficiently, those substances may be lost in the urine instead of returning to the bloodstream. This can lead to imbalances in the body's internal environment. For example, inefficient reabsorption of glucose could result in glycosuria (glucose in the urine), which may be a sign of diabetes. Similarly, problems with reabsorbing amino acids or electrolytes could disrupt nerve and muscle function or cause electrolyte imbalances, affecting the body's internal balance and overall health.

