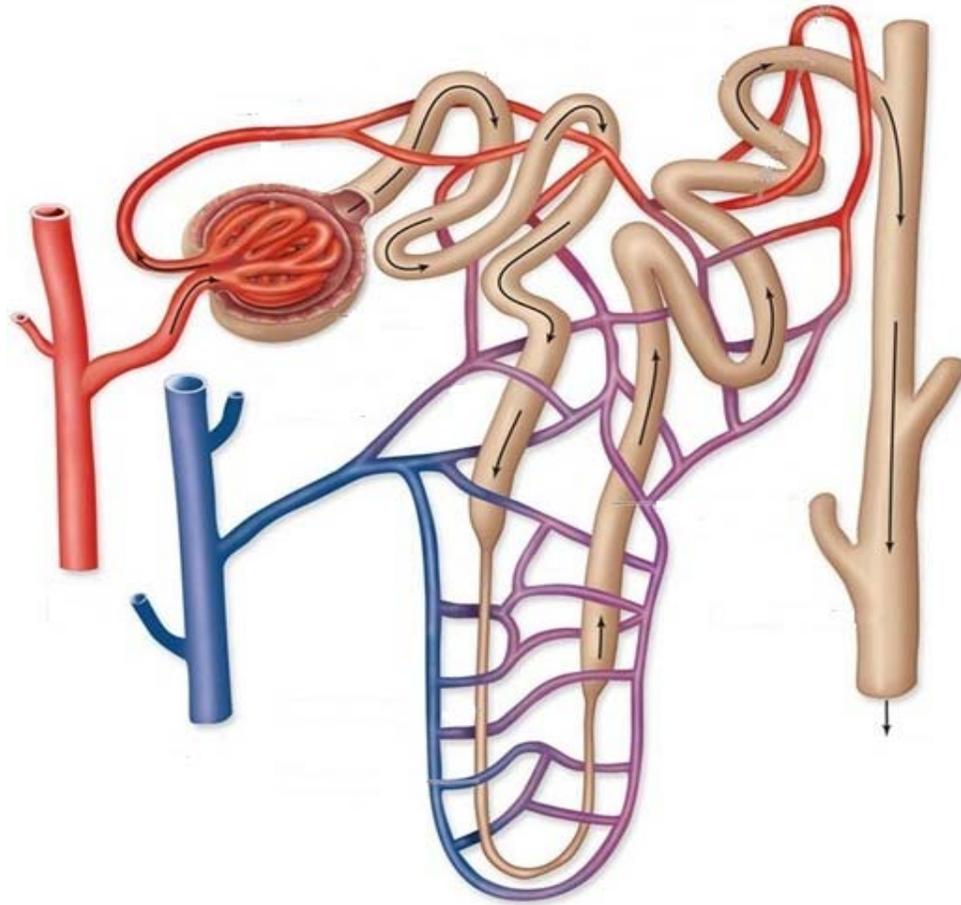


Anatomy of the Nephron and Urine Production Honors Anatomy

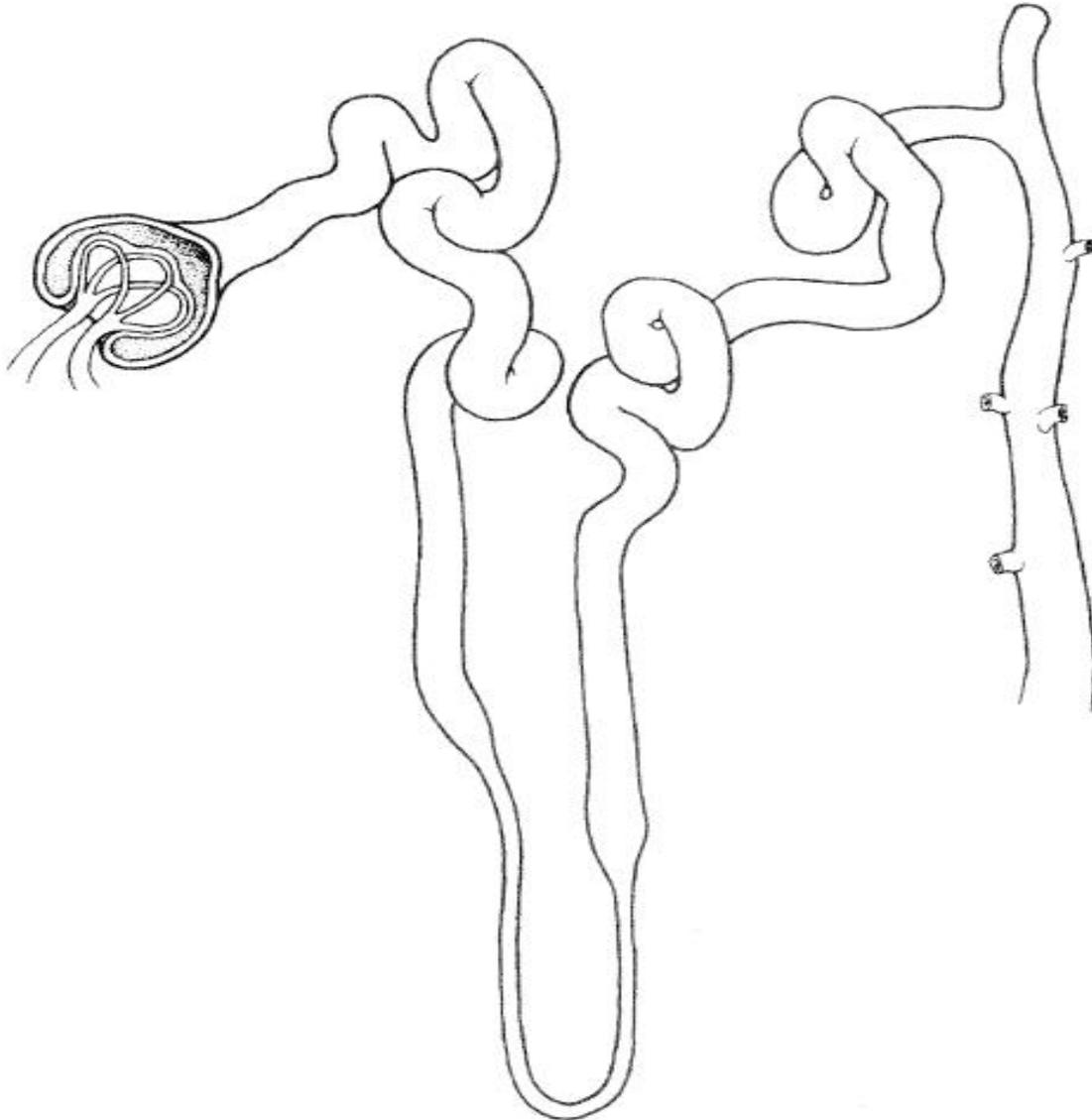
Using the list below, label the different parts of the nephron.



- | | | | |
|--------------------|--------------------------|----------------------------|------------------|
| Afferent arteriole | Distal convoluted tubule | Peritubular capillaries | Loop of Henle |
| Bowman's capsule | Efferent arteriole | Proximal convoluted tubule | -Ascending limb |
| Collecting duct | Glomerulus | Venule | -Descending limb |

1. The separation of smaller molecules from larger molecules that occurs between the glomerulus and Bowman's capsule is called _____.
2. The movement of substances, ions, molecules, or fluids from any tubules of the nephron into the peritubular capillaries is called _____.
3. The movement of substances, ions, molecules, or fluids from the peritubular capillaries into any tubules of the nephron is called _____.
4. Beginning with the glomerulus and ending in the collecting duct, draw a flow map illustrating the pathway of the formation of urine.
(You will be using the terms above with the exceptions of efferent arteriole, afferent arteriole, peritubular capillaries venule,

Using the list below, label the parts of the nephron.



Bowman's capsule

Glomerulus

Loop of Henle

Collecting duct

Proximal convoluted tubule

Ascending limb

Distal convoluted tubule

Descending limb

1. Draw green arrows illustrating **glomerular filtration** of the following substances: water, urea, glucose, amino acids, sodium, chloride. Label water, urea, glucose, amino acids, and salts
2. At the proximal convoluted tubule, the descending limb of the Loop of Henle and the collecting ducts, draw blue arrows illustrating the **tubular reabsorption** of water. Label water.
3. At the proximal convoluted tubule and the ascending limb of the Loop of Henle, draw purple arrows illustrating the **tubular reabsorption** of sodium and chloride. Label sodium (Na^+) and chloride (Cl^-).
4. At the proximal convoluted tubule, draw an orange arrow illustrating the **tubular reabsorption** of glucose. Label glucose.
5. At the proximal convoluted tubule, draw a yellow arrow illustrating the **tubular reabsorption** of amino acids. Label amino acids.
6. At the distal convoluted tubule, draw a red arrow illustrating the **tubular secretion** of hydrogen ions. Label hydrogen ions (H^+).
7. At the distal convoluted tubule, draw a pink arrow illustrating the **tubular secretion** of ammonia. Label ammonia (NH_4^+).
8. At the distal convoluted tubule, draw a brown arrow illustrating the **tubular secretion** of drugs. Label drugs.

Substances, water, molecules, and salts can move into and out of the nephron 3 ways; **active transport, passive transport, and facilitated diffusion.**

Complete the paragraph about the formation and transportation of urine through the nephron.

The excretion of metabolic waste and the formation of urine is performed by the 1 . Specifically, urine formation occurs in the 2 within the kidneys. Metabolic waste carried by blood arrives at the nephron via the afferent arteriole and finally into the 3 . Smaller metabolic waste, such as water, glucose, and ions diffuse from the glomerulus to 4 _____ in a process known as 5 _____. Filtered blood exits the glomerulus via the efferent arteriole which becomes the peritubular capillaries. From Bowman's capsule, metabolic waste travels to the _____ 6 _____, then to the 7 _____ and 8 _____ of the Loop of Henle. From the Loop of Henle metabolic waste enters the _____ 9 _____ before finally exiting the nephron through the 10 _____. All collecting ducts of nephrons transport their urine to the minor calyces in the kidney. Within each tubule of the nephron, specific processes occur to help rid the body of metabolic wastes, regulate water-salt balance, and regulate acid-base balance. In the _____ 11 _____, water, glucose, and ions are transported out of the nephron and back into the 12 _____ by a process called 13 _____. Reabsorption also occurs in the Loop of Henle. The descending limb is responsible for the reabsorption of 14 _____, while the ascending limb is responsible for the reabsorption of the ions 15 and 16 _____. Conversely, in the _____ 17 _____, substances such as hydrogen ions, ammonia, and drugs are transported out of the 18 _____ and into the kidney tubule by the process of 19 _____. Finally in the collecting duct, further reabsorption of 20 _____ is determined by the needs of the body. This final process determines whether the urine is concentrated or diluted. Movement of substances into and out of nephron tubules is accomplished by 3 processes; 21 _____, which requires energy to move substances, 22 _____, which does not require energy but uses the natural movement of substances from higher concentrations to lower concentrations, and by 23 _____, which utilizes diffusion and a carrier molecule to transport substances across the nephron.

1. _____
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21. _____
22. _____
23. _____