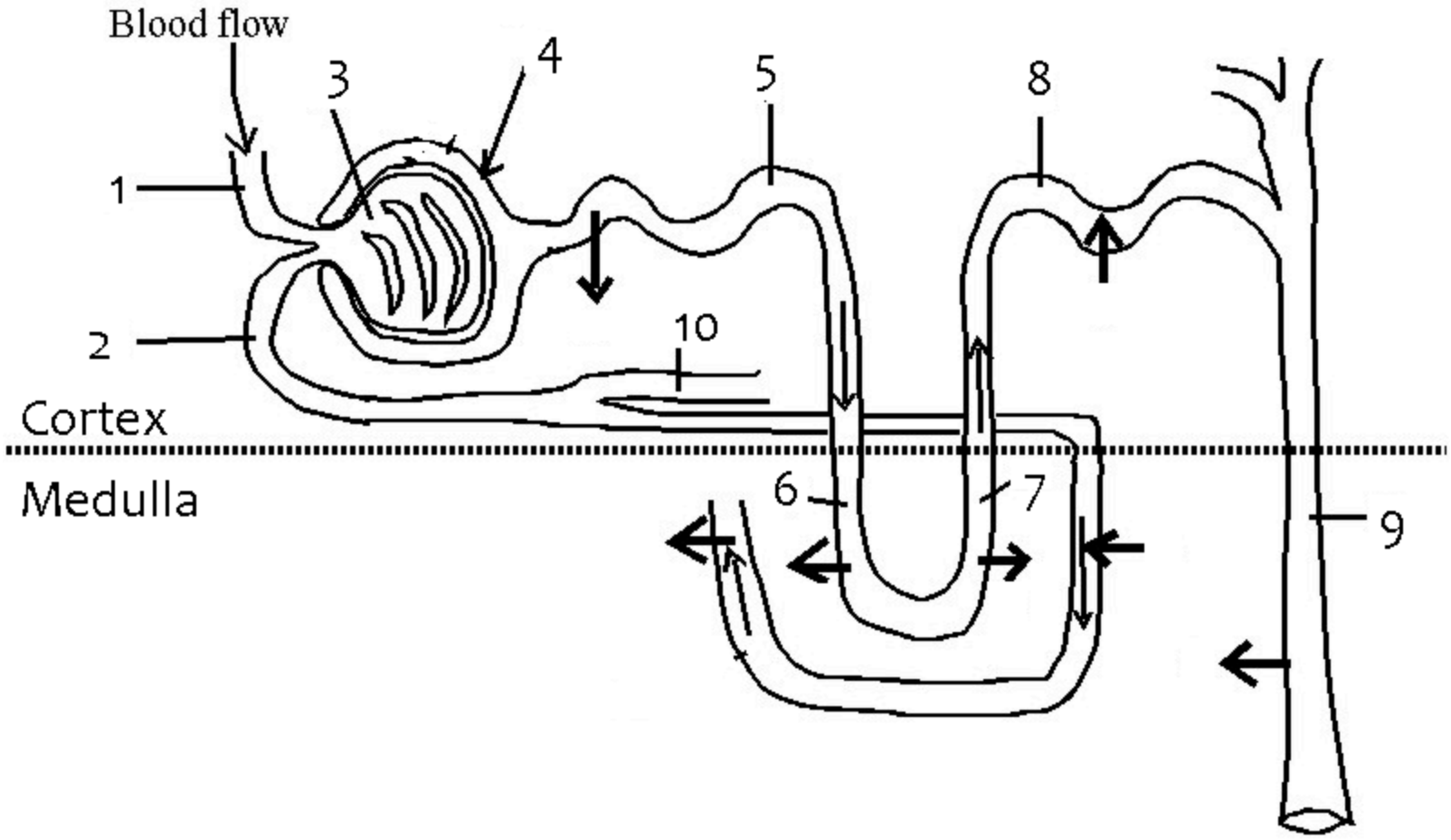
Name: _____

The Nephron



Name: _____

Use the corresponding number from the table below and write in the name of each structure.

STRUCTURE NAME	DESCRIPTION	FUNCTION
1. Afferent Arteriole		- brings arterial blood into glomerulus
2. Efferent Arteriole		- takes **arterial** blood away from glomerulus to go to peritubular capillary bed
3. Glomerulus	- capillary bed	- Increases surface area so high blood pressure "pushes" plasma (water!) and ions, glucose, amino acids, wastes from blood across membrane to form **filtrate**
4. Bowman's Capsule	-surrounds glomerulus like a cup	- to collect nephric filtrate

Name: _____

5. Proximal Tubule	-very convoluted tubule	- glucose is reabsorbed from filtrate to blood - active transport of Na^+ from filtrate to blood - followed by K^+, Cl^-, HCO_3^- - blood and filtrate are **isotonic** to each other at the end of this tubule
6. Descending Loop of Henle	- tube from cortex to medulla	- this part of loop is permeable to water but **not** permeable to Na^+ or Cl^- - water leaves filtrate by **osmosis**

7. Ascending Loop of Henle	- tube that returns filtrate from medulla to cortex	- this part of loop is **permeable** to Na^+ but **not** permeable to water - the ascending loop uses active transport to pump Na^+ out of the filtrate into the blood - Cl^- ions follow passively

Name: _____

8. Distal Tubule	-very convoluted tubule	- active transport of H^+, Na^+, creatine and drugs out of blood into filtrate by **secretion** - permeability to water changes as needed under influence of hormones
9. Collecting Duct	- tube to renal pelvis	- Na+ Cl- is actively reabsorbed - permeability to water changes as needed under influence of hormones to regulate blood water volume
10. Peritubular Capillaries	- complex blood vessel structures	- wrap around nephron to absorb water, ions, glucose and other substances from the filtrate back into the blood

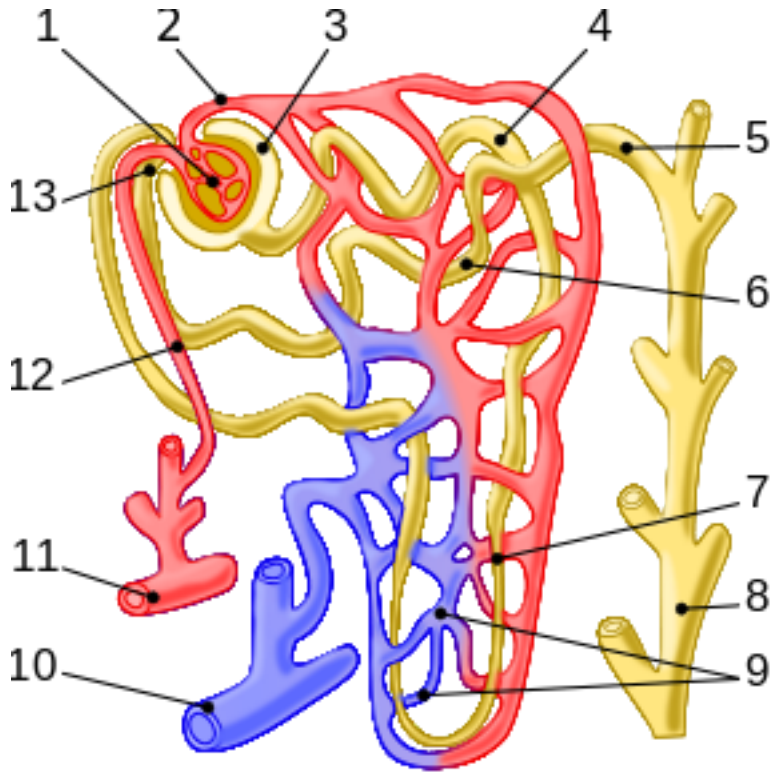
Name: _____

		- the flow of blood is **opposite** to the flow of filtrate in the Loop of Henle

Name: _____

Test Yourself – Name all the parts without looking at your notes.

Put arrows on the diagram to show the flow of blood. Check out the blood flow! This is a counter-current blood flow compared to the flow of filtrate in the Loop of Henle.



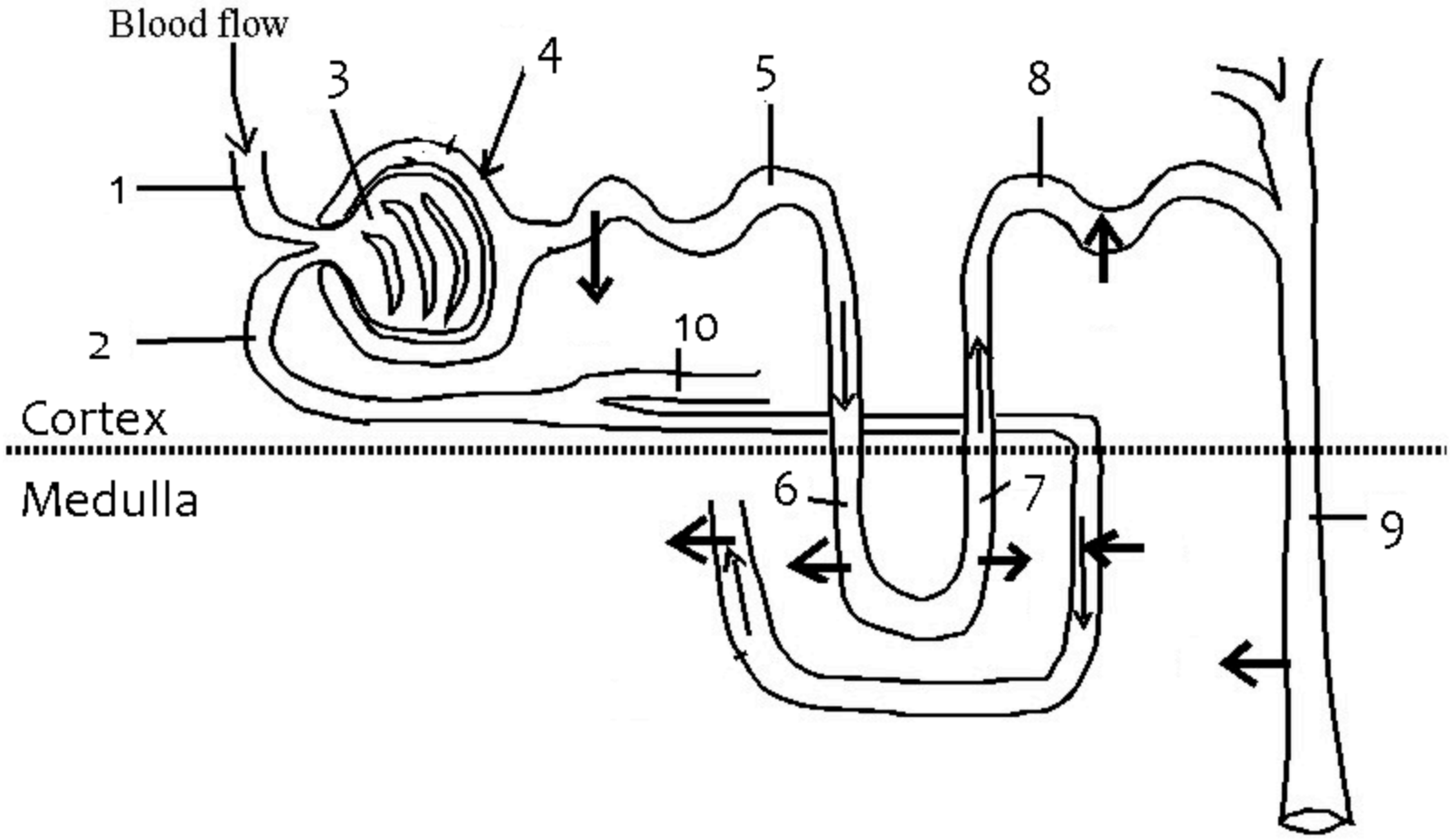
The basic physiology of a nephron within a kidney: The labels are: 1. Glomerulus, 2. Efferent arteriole, 3. Bowman's capsule, 4. Proximal tube, 5. collecting tube, 6. Distal tube, 7. Descending Loop of Henle, 8. Collecting duct, 9. Peritubular capillaries, 10.

Name: _____

renal vein, 11.renal artery, 12. Afferent arteriole, and 13. Juxtaglomerular apparatus (for blood pressure regulation)

Name: _____

The Nephron



Name: _____

Use the corresponding number from the table below and write in the name of each structure.

Name: _____

THE NEPHRON

STRUCTURE NAME	DESCRIPTION	FUNCTION
1. Afferent Arteriole		
2. Efferent Arteriole		
3. Glomerulus	- capillary bed	
4. Bowman's Capsule	-surrounds glomerulus like a cup	
5. Proximal Tubule	-very convoluted tubule **before** Loop of Henle	

Name: _____

6. Descending Loop of Henle	- tube that takes filtrate from cortex to medulla	
7. Ascending Loop of Henle	- tube that returns filtrate from medulla to cortex	

Name: _____

THE NEPHRON

STRUCTURE NAME	DESCRIPTION	FUNCTION
8. Distal Tubule	-very convoluted tubule **after** Loop of Henle	
9. Collecting Duct	- tube to renal pelvis	
10. Peritubular Capillaries	- complex blood vessel structures	

Name: _____

Wikipedia research

Considerable differences distinguish the descending and ascending limbs of the loop of Henle. The descending limb is permeable to water and noticeably less impermeable to salt, and thus only indirectly contributes to the concentration of the interstitium. As the filtrate descends deeper into the hypertonic interstitium of the renal medulla, water flows freely out of the descending limb by osmosis until the tonicity of the filtrate and interstitium equilibrate. Longer descending limbs allow more time for water to flow out of the filtrate, so longer limbs make the filtrate more hypertonic than shorter limbs.[*citation needed*]

Unlike the descending limb, the Thin ascending limb of loop of Henle is impermeable to water, a critical feature of the countercurrent exchange mechanism employed by the loop. The ascending limb actively pumps sodium out of the filtrate, generating the hypertonic interstitium that drives countercurrent exchange. In passing through the ascending limb, the filtrate grows hypotonic since it has lost much of its sodium content. This hypotonic filtrate is passed to the distal convoluted tubule in the renal cortex.[*citation needed*]

The distal convoluted tubule has a different structure and function to that of the proximal convoluted tubule. Cells lining the tubule have numerous mitochondria to produce enough energy (ATP) for active transport to take place. Much of the ion transport taking place in the distal convoluted tubule is regulated by the endocrine system. In the presence of parathyroid hormone, the distal convoluted tubule reabsorbs more calcium and excretes more phosphate. When aldosterone is present, more sodium is reabsorbed and more potassium excreted. Atrial natriuretic peptide causes the distal convoluted tubule to excrete more sodium. In addition, the tubule also secretes hydrogen and ammonium to regulate pH.[*citation needed*]

Name: _____