**Biology 12: Prereading activity ANSWER KEY:**

Chp.16. and Chp. 16.2

**“U – R” ABOUT TO LEARN ABOUT THE:**

**URINARY SYSTEM**

**TASK: Read pages 304 to 309 and answer the following questions**

1. What are the primary organs of excretion?
* ***Kidneys***
1. Define excretion. How does excretion and defecation differ?
* ***The removal of metabolic waste.(urine)***
* ***Defecation is the elimination of feces (digestive system)***
1. List and describe the four functions of the kidneys to maintain homeostasis.
2. ***Excretion of metabolic waste: (urea, ammonium, creatine, and uric acid***
3. ***Maintain water/salt balance: (and blood pressure) by diffusion of water into the blood***
4. ***Maintain acid-base balance: excrete H+and reabsorb bicarbonate (HCO3-)***
5. ***Secretes hormones: assist endocrine system; adrenal gland secretes aldosterone and erythropoietin (RBC production)***
6. For each of the following organs, list the function and describe its structure:

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| **Organ** | **Structure** | **Function** |
| **Kidney** | ***Paired, towards back, either side of vertebrae, bean shaped, red brown colour, fist sized, surrounded by adipose tissue and capsule*** | ***Maintain water balance; removal of urea; removal of uric acid*** |
| **Ureter** | ***Small muscular tubes 25 cm long and 5 mm in diameter*** | ***Tubes that connect urine from kidneys to bladder*** |
| **Urinary Bladder** | ***Muscular organ (3 layers of muscles: two longitudinal middle layer is circular muscle) with 3 openings. Has rugae (folds in the mucosa)*** | ***Stores urine until expelled. Skeletal muscle sphincter (voluntary) control (200, 400, 600 mL: involuntary release*** |
| **Urethra** | ***Small tube extrends from bladder to opening. Males: 20 cm and connected to repro system. Females: 4 cm and not connected to repro system.*** | ***Removes urine from the body*** |

1. What is another name for Urination and describe this process.

***Micturition***: ***250mL stretch receptors send nerve impulse to spinal cord causing bladder to contract and sphincters to relax. Voluntary in adults and older children.***

1. Draw a sketch of a cross section of a kidney and label the renal cortex, renal medulla, renal artery, renal vein and renal pelvis.



1. Name 5 parts of a nephron and briefly describe their function.
2. ***Glomerular Capsule: (Bowman’s Capsule): Cuplike structure of nephron which receives filtered fluid from glomerulus via afferent arteriole via renal artery.***
3. ***PCT: proximal convoluted tubule: Glomerular reabsorption: microvilli increase absorption***
4. ***Loop of Henle: (loop of the nephron): Tubular reabsorption: water leaves via osmosis and Na and Cl***
5. ***DCT: Distal convoluted tubule: (lots of mitochondria but no microvilli) tubular secretion (move molecules from the blood into the tubule)***
6. ***Collecting Duct: carry urine to renal pelvis.***
7. What are the 3 stages of urine formation?
8. ***Glomerular Filtration***
9. ***Tubular Reabsorption***
10. ***Tubular secretion***
11. What are the filterable components of the blood in the glomerulus?

***Water, nitrogenous wastes, nutrients, salts (pass through capillary wall)***

1. What are the non-filterable components of the blood in the glomerulus?

***Formed elements (blood cells and platelets); plasma proteins***

1. Why does tubular reabsorption have to occur?
2. ***Water reabsorbed from nephron into the capillary network.***
3. ***Maintains osmoregularity of the blood (active transport: Na+ glucose and A.A) (passive: water moves from tubule into the blood)***
4. What is reabsorbed?

***Water, sodium, glucose, urea (water, nutrients, required salts)***

1. What are 3 components that are **not** reabsorbed and continue to pass through the nephron to be further processed?

***Some water, nitrogenous wastes, excess salts (ions)***

1. What molecules are added to the urine in tubular secretion?

***(Secreted from peritubular capillary network into tubules): H+, K+ ions, creatine, and drugs (penicillin)***