**Nephrons Lab: Lesson Plan**

*Adapted from Sciencing*

**Resources**

* One clear glass
* One coffee filter
* One elastic band
* ½ cup of water
* One tablespoon of sand
* Red food dye

**Objectives**

1. Students will learn about the functions of the kidney.
2. Students will learn about the functional unit of the kidney, the nephron.
3. Students will learn common conditions that affect the kidneys using the Physiology & Pathology app by Visible Body.

**Introduction**

20 minutes: Direct students to the Renal unit to view The Kidneys: Blood Filtration lesson. Students should also view Fluid Balance animation; Filtration, Reabsorption, and Secretion animation; and the Nephron Function 3D lesson in the Physiology & Pathology app by Visible Body.

The role of the kidneys is to produce urine as a filtrate of blood. That filtered blood is then sent back to the heart for recirculation. You may choose to review key concepts with your students. All the underlined items below can be found in the Renal module of the Physiology & Pathology app.

Here are some important concepts to keep in mind:

* The kidneys are the waste secreting organs of the urinary system. The filtering is done by small units called nephrons.
* Nephrons are responsible for filtering blood that will be recirculated and creating urine to be excreted from the body.
* Each nephron contains a renal corpuscle, which is responsible for filtering blood. The renal corpuscle is made up of two structures, the glomerulus and Bowman’s capsule.
* Also, each nephron contains a renal tubule. The renal tubule is the location where waste is converted into urine.
* The renal tubule can be broken up into three parts: the proximal convoluted tubule, the loop of Henle, and the distal convoluted tubule.

Students should also view the Acute Renal Failure animation and the Kidney Stones lesson presented in the Physiology & Pathology app by Visible Body.

**Activity**

25 minutes: In the first part, students will mimic filtration conducted by the nephrons and gain a better understanding of why filtration is a vital life-sustaining process.

Direct the students to view the Acute Renal Failure animation and the Kidney Stones lesson in the Renal unit of Visible Body’s Physiology & Pathology app.

The second part of the activity consists of answering reflection questions about the activity and pathology animations.

**Discussion Questions**

1. What are the three main processes involved in kidney function?
2. Why would severe dehydration cause acute renal failure?
3. Explain how kidney stones might affect urine flow through the urinary tract.
4. Explain how blood flows through the kidneys.
5. FIltered waste is converted into urine in what structure?
6. What role do the kidneys play in pH balance?