Name: Date:

Nephrons Lab

*Adapted from Sciencing*

*Last updated: 10/18/22*

# Introduction

Nephrons are the functional unit of the kidneys. This means that without nephrons, the kidneys would not be able to do their job of filtering out waste products from our blood. This is a life-sustaining process. The goal of this lab is to mimic the job of the nephrons using everyday materials.

# Resources

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

# Directions

## Part 1: Activity

1. Fill a clear glass with ½ cup of water.
2. Mix in a few drops of red food dye until the content is bright red.
3. Add a spoonful of sand to the water.
4. Swirl the contents around and observe the solution’s appearance.
5. Place the coffee filter on the empty beaker.
6. Secure the coffee filter by placing the elastic band over the opening of the beaker..
7. Slowly pour the mixture over the coffee filter.
8. Once all contents have been poured, examine the contents on top of the coffee filter as well as the solution that filtered through the coffee filter.

## Part 2: Thought Questions

Answer the following questions:

1. What structure does the coffee filter in this activity represent? What histological feature makes this structure able to filter products?
2. What does the unfiltered material at the top of the coffee filter represent? What would be the next step for this material?
3. What difference did you note in the appearance of the solution in step 4 versus step 8? Explain why this reflects the importance of filtration in the kidneys.
4. Open the Physiology & Pathology app by Visible Body and view the Kidney Stones lesson. Why might kidney stones lead to renal failure?
5. Open the Physiology & Pathology app by Visible Body and watch the Acute Renal Failure animation. Why would severe dehydration be a cause of Acute Renal Failure? Why would this be considered a medical emergency?

**Bonus Question:** Causes of Renal Failure are grouped into three categories. Name the three categories.