



## Supplies

---

- Glass/jug of water (representing blood - red food coloring can be added)
- Yellow food coloring (representing toxins)
- Beads (representing protein)
- Two coffee filters (representing kidneys)
- Two clear plastic glasses or jars
- Kidney model or image with filtering units (e.g., glomeruli)
- Age-appropriate scissors
- Rubber bands (to secure coffee filters)

## The Experiment

---

### INTRO

---

The purpose of this experiment is to give students a hands-on, visual understanding of kidney function and to explain how Nephrotic Syndrome impacts the kidneys' ability to properly filter and retain important proteins.

This kidney function experiment has been completed in class by a patient family to help spark conversation and bring awareness to Nephrotic Syndrome.

Depending on the age of the kids - you can do much of the setup ahead of time. For example: Get all of the cups and filters rubber banded on, and make the cuts to the filters the night before, and then bring it with everything ready to go. You can wait to add the dye to the water while in the class because the kids love to see that.

### Share details about kidneys

Begin by asking a few questions to introduce the kidneys—what they are, what they do, and their importance in the body. After a brief discussion, you can dive into the experiment. Feel free to use questions or facts found in the Class Presentation and / or The Better Choice Food Game PDF's on NSF's website.

### EXPERIMENT

---

Start by showing how a healthy kidney works. Each child will participate by adding beads (protein) into the jug of water, which represents blood. Then place a coffee filter over a container, add a few drops of yellow food coloring on the filter (representing toxins) , and pour the water (blood) over the filter.

### **What happens?**

As the water (blood) passes through the coffee filter (kidney), the yellow color (toxins) will be filtered out, while the beads (protein) will stay behind, illustrating how healthy kidneys retain good products like protein and eliminate toxins in the urine.

Next, you'll simulate Nephrotic Syndrome by using coffee filters with small holes. Repeat the process, but this time, the beads will pass through the filter along with the water, showing how damaged glomeruli in Nephrotic Syndrome allow proteins to leak into the urine. This visual representation helps explain how the kidneys are affected by Nephrotic Syndrome.

### **Wrap Up**

When the experiment is complete, you can reiterate that Nephrotic Syndrome is not contagious and not because of something someone did - it's just something some people are born with and that the patients who have it are some of the most incredibly strong and brave kids. And that it's our job as their friends and family to support them, encourage them, and learn about what they have so we can help teach others - because the more we all know the more we can help.

---

### **Helpful Tip**

This experiment can also be set up where kids are given a normal kidney AND a nephrotic kidney, and they don't know which one they have until they see the beads slip through - then they go, oh man! I have a nephrotic kidney. Or yay, I have a normal kidney.

---

Thank you to The Salerno Family for sharing and guiding this experiment!