

Urinary System

Lesson Overview

In this lesson, students will review the functions of the human body's excretory system, including the four major organs of the urinary system. Students will use highlighting to review these functions, demonstrate an understanding of the functions using brainstorming and model building, and explain the relationship between the circulatory system and urinary system by Making Thinking Visible.

Standards Addressed

- SC 2005 7-3.2 Recall the major organs of the human body systems.
- 7-3.3 Summarize the relationships between human body systems.
- SC 2014 7.L.3B.2 Construct explanations for how systems in the human body (including circulatory, respiratory, digestive, excretory, nervous, and musculoskeletal systems) work together to support the essential life functions of the body.
- NGSS MS-LS 1-3 Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

Disciplinary Literacy Best Practices

Think Pair Share

Give Me Five

Highlighting

Making Thinking Visible (MTV)

Lesson Plan

Time Required: Two 50-minute Class Periods

Disciplinary Vocabulary: excretory system, urinary system, circulatory system, blood, urine, kidney, ureter, bladder, urethra

Materials:

- Article: “Your Urinary System” (<http://kidshealth.org/kid/htbw/pee.html>)
- Two Different Colored Highlighters
- Graph Paper
- Poster Paper
- Supplies to Build Urinary System (funnels, filter paper, tubes, buckets, plastic bags, straws, clamps, etc.)

Assessment: Making Thinking Visible

Engage

- The teacher will be holding a clear bottle of yellow-colored water with red glitter. Shake it up! The glitter will spread throughout the mixture.
- Ask students to pair share what body fluid(s) the mixture represents, and have them explain the relationship of these fluids.
- Using Give Me Five, have five people share their insights. (The yellow represents urine, the red represents blood. When the mixture is shaken, this is the “blood”, but the urine eventually separates out.)

Explore

- Using highlighters to differentiate between structure (organs) and function (what each organ does). Students will first highlight only the organs of the urinary system as they read the article (in one color). Using another color highlighter, students will read the article again, highlighting the function of each organ.
- Students will use a variety of materials to brainstorm and build a working model of the urinary system. Groups should begin by drawing a brainstorm of how they might construct their model. Then they will try and tweak the design. At the end, each group will test the model using the red glitter/ yellow water mixture. The red glitter (“blood”) should remain in the filter paper in the kidneys; the yellow water (“urine”) should exit through the model’s urethra.

Explain

- Groups will discuss their models, explain (through dialogue and writing) the individual functions of each organ of the urinary system, and explain (through dialogue and writing) the relationship between the circulatory and excretory systems.
- On a large piece of poster, each group will use the MTV strategy and include their initial brainstorm, a final drawing of the model (with labels and functions for each organ), and an explanation of the relationship between the circulatory and excretory system in their own words. For extra credit, students can draw and explain the components of the yellow water/ red glitter mixture.

Teacher Reflections and Biographical Information

I created this lab three years ago and have been fine-tuning it since then. The disciplinary literacy strategies that I included in it this past year have really helped students make high level connections that were missing in the past. Please let me know if you have any questions about it!

Lesson Author:

My name is Caroline Weathers, and I have been teaching at St. George Middle School for six years. After studying Biological Sciences at Clemson University, I served as a Peace Corps volunteer in Haiti. I later earned a Master's degree in Anthropology at the University of Georgia, focusing on ethnobotany and nutritional anthropology. I returned to St. George (my hometown) in 2007, and I became certified as a teacher through PACE. I am married to Matt Williams and have two beautiful daughters, Kora and Acacia. My current professional interests include dynamic classroom grouping, self-organized learning environments, and student-centered learning strategies.