

Title: Comparing and Contrasting Electrolytes in the Body (part 1)

Objectives Students will be able to read for information about electrolytes in the body. Students will be able to compare and contrast sodium and potassium using a Venn diagram.													Time frame to Complete 30-45 minutes												
													NRS EFL 4												
Stackable Cert.	Documentation	Technology	Study / Life skills	EL-Civics	Career Pathways	Police	Paramedic	Fire Rescue	Medical Asst.	EKG / Cardio	Phlebotomy	Practical Nursing	Healthcare Admin	Pharmacy Tech	IMT	AMT	HVAC	Welding	Other:	Nutrition and Dietetics	STNA				
X			X						X	X	X	X								X		X			
Standard(s) Addressed in Lesson Read with Understanding																									
Benchmark(s) Addressed in Lesson R.4.1. Identify purposes for reading (for example, to generate and answer questions about a topic, to solve problems) R.4.5. Use context clues (for example, cause and effect and compare and contrast relationships) to determine the meaning of words in texts. R.4.8. Understand meaning of some specialized content vocabulary (for example, "constitution"). R.4.11. Apply, monitor and adjust comprehension strategies (for example, note subtle details in texts, pose questions about text) to understand text at an inferential level. R.4.12. Use structural elements and organizational strategies (for example, problem and solution, cause and effect) to aid in comprehension of print and electronic texts. R.4.16. Construct meaning from text by evaluating relevance of prior knowledge and applying appropriate knowledge to new information read.																									
Materials <i>Sodium-Potassium</i> handout Venn diagram																									
Learner Prior Knowledge Students should understand what it means to compare and contrast.																									
Activities <u>Step 1</u> A brief discussion can introduce the topic. Ask students to share what they know about electrolytes, sodium, and potassium. What are they? Where are they found? How do they affect the body? (Students may have very little prior knowledge. If so, introduce the topic by saying that sodium and potassium are minerals that are necessary parts of our diets. Too much or too little will impact our general health. Today's lesson will explain more about their roles in the human body.) <u>Step 2</u> Distribute the <i>Sodium-Potassium</i> handout. Students read the handout independently. <u>Step 3</u> Distribute the Venn diagram. Explain to students that the Venn diagram is used to chart the ways that																									

two things are similar and different. In the left-hand circle, students will list facts that are unique to sodium; in the right-hand circle, students will list facts that are unique to potassium. In the middle section, where the circles overlap, students will write facts that sodium and potassium have in common. As a class, begin the Venn diagram by listing one fact in each section, and then students can complete their Venn diagrams independently.

Step 4 Discussion may follow, allowing students to check their work and clarify their understanding.

Assessment/Evidence

Completed Venn diagram

Adaptations for Beginning Students

Beginning students may need to listen to the article rather than reading it independently or use a dictionary to assist them with the reading.

Adaptations for Advanced Students

Advanced students can also research Chloride and add a third circle to their Venn diagram.

Teacher Reflection/Lesson Evaluation

Initially, the only thing people knew about electrolytes was "Gatorade," so this lesson was very informative.

This lesson was created by Middletown ABLE.

Sodium

The mineral sodium is necessary for the regulation of water and fluid in the body. If the body's fluid levels are not balanced, cells can swell and result in medical problems. Approximately 30% of the body's sodium is stored in the bones, 60% in the blood, and 10% in the cells. Sodium is a main component of blood plasma. It helps to keep blood from clotting, helps maintain the body's pH balance, and helps deliver nutrients to our cells.

Sodium, often abbreviated as Na, is an electrolyte, which means it helps control the electric charges between our cells. These electric charges enable cells to communicate with each other and are responsible for transmitting nerve impulses for our five senses – seeing, smelling, tasting, hearing, and touching.

In addition, the levels of sodium have a major effect on blood pressure. Sodium helps keep blood volume and blood pressure in normal ranges. Too much sodium can result in high blood pressure. High blood pressure can result in heart disease, cardiac arrest, or stroke. Recently, too much salt in one's diet has also been linked to increased risks of cancer, dementia, and osteoporosis. The body needs approximately 100 mg of sodium each day to maintain balance.

Unfortunately, most Americans consume too much sodium. The USDA recommends limiting salt-intake to less than 1,500 mg per day (approximately 2/3 teaspoon), but the average American consumes 3,400 mg per day. Packaged or prepared foods such as soups, lunch meats, frozen pizzas, potato chips, and sodas contain high levels of sodium because salt (sodium combined with chloride ions) is used as a preservative. To reduce the amount of sodium in one's diet, purchase fresh meats and vegetables, buy low-sodium versions of soups or other foods when possible, and avoid foods with prepackaged seasonings.

The body eliminates sodium through urine and sweat, but a sodium deficiency is rare. Too little sodium can make a person feel weak and fatigued. A sodium deficiency can cause various ailments from muscle cramps to seizures.

Potassium

Potassium is a mineral, often abbreviated as K, that is necessary for the health of nerves and muscles. Ninety-five percent of the body's potassium is stored within cells.

Potassium is an electrolyte, which means it helps control the electric charges between our cells. These electric charges enable cells to communicate with each other and are responsible for transmitting nerve impulses for our five senses – seeing, smelling, tasting, hearing, and touching. These electrical impulses are also responsible for the contracting of muscles. As a muscle, the heart relies on potassium to maintain its beating. Potassium also helps to convert blood sugar into glycogen, which is used to supply energy for our muscles. Potassium also helps to regulate water levels in the body.

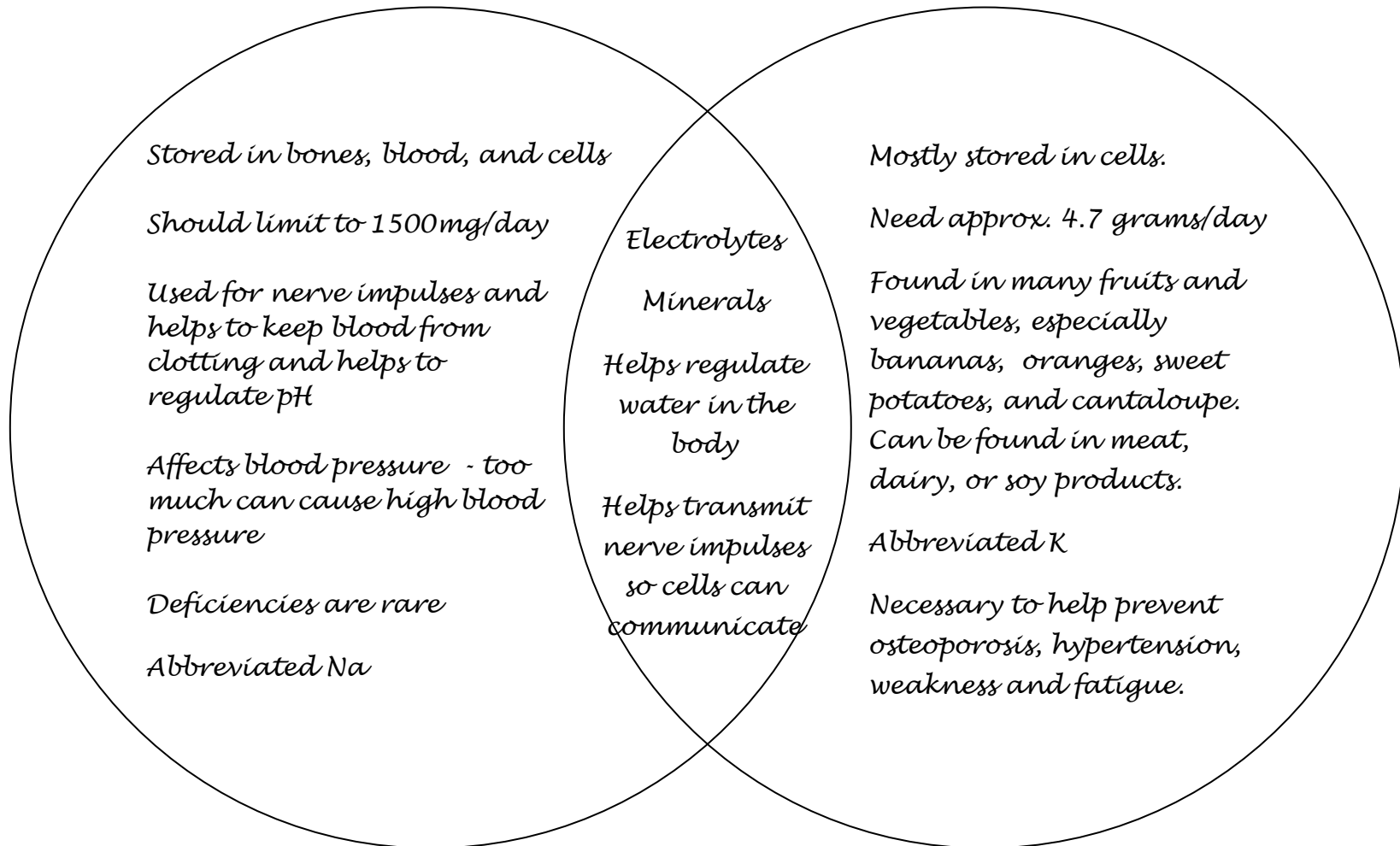
Good sources of potassium include bananas, oranges, cantaloupes, kiwis, dates, prunes, apricots, sweet potatoes, tomatoes, and other fresh produce. Potassium can also be found in soy products, meats, legumes, whole grains, and dairy products. An adequate intake of potassium is approximately 4.7 grams per day. However, because so many factors affect the body's levels of potassium, a government RDA has not been established.

Potassium deficiencies have been linked to osteoporosis, hypertension, and weakness and fatigue. Symptoms of potassium deficiency can include water retention, excessive thirst, loss of appetite, earaches, headaches, poor circulation, insomnia, and irregular heartbeat. People with high blood pressure, diabetes, or anorexia may be prone to potassium deficiencies. People with kidneys that don't function properly may develop hyperkalemia, a condition where the body retains too much calcium because it cannot be filtered or excreted properly. People with these medical conditions should consult with their doctors and monitor their potassium levels.

Sodium

Potassium

Both



Sample Venn Diagram

Venn Diagram

