

Title: Comparing and Contrasting Electrolytes in the Body (part 2)

Objectives Students will be able to write a multi-paragraph compare-contrast essay.										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 Write to Convey Ideas																						
Benchmark(s) Addressed in Lesson W.4.2. Write for varying purposes (for example, to persuade, to explain, to entertain). W.4.3. Write for varying types of tasks (for example, business letters, letters to the editor, job applications, literature responses, informational essays, informal writing). W.4.5. Formulate a thesis from a main or controlling idea. W.4.10. Choose an organizational pattern (for example, order of importance, problem to solution, topical) to present ideas logically. W.4.11. Develop writing with an effective introduction, a body and a conclusion that summarizes, extends or elaborates on points or ideas in the writing. W.4.12. Group related ideas into well-developed paragraphs with topic sentences and supporting sentences. W.4.19. Reread and revise writing to clarify meaning (for example, sentence variety, transitions among paragraphs).																						
Materials <i>Sodium-Potassium</i> handout (from Comparing and Contrasting Electrolytes – part 1) Completed Venn diagram (from Comparing and Contrasting Electrolytes – part 1) Paper and pencil																						
Learner Prior Knowledge Students should understand what it means to compare and contrast. Students should use standard writing conventions to write complete sentences and paragraphs. Students should understand and recognize thesis statement, supporting details, introduction, and conclusion.																						
Activities * Note * This lesson is a follow-up activity to a reading lesson titled Comparing and Contrasting Electrolytes – part 1. <u>Step 1</u> Review the basic components of a compare-contrast essay including thesis statement, supporting details, and suggested structures. One suggested structure is a four-paragraph essay that contains an introductory paragraph, one paragraph about topic A, one paragraph about topic B, and a concluding paragraph. Another suggested structure is a five-paragraph essay that contains an introductory paragraph, a series of three paragraphs that each compares and contrasts one aspect of the two topics, and a concluding paragraph.																						

Step 2 Students review the Sodium-Potassium handout and their completed Venn diagram (from Comparing and Contrasting Electrolytes – part 1). Students determine the most important similarities and differences between sodium and potassium and plan a multi-paragraph essay based upon a suggested structure for comparing and contrasting the two electrolytes.

Step 3 Students compose essays, seeking help as needed.

Step 4 The teacher reads the essays and provides guidance regarding organization, sentence structure, transitions, or content. Students revise as necessary.

Assessment/Evidence

Compare-contrast essay. (This may be used as documentation for a Stackable Certificate. Copy for student portfolio if applicable.)

Adaptations for Beginning Students

Beginning students may complete a more limited assignment such as writing one paragraph that compares the two topics. Or, beginning students may use an online tool which helps them organize a multi-paragraph compare/contrast essay – available at

<http://www.readwritethink.org/files/resources/interactives/comcontrast/map.html>.

Adaptations for Advanced Students

Advanced students may deviate from the suggested format and write a longer essay. If more challenge is needed, students may also research chloride (another electrolyte) and include details about it in the essay.

Teacher Reflection/Lesson Evaluation

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 potassium 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

Stored in bones, blood, and cells

Should limit to 1500mg/day

Used for nerve impulses and

helps to keep blood from

clotting and helps to

regulate pH

Affects blood pressure - too

much can cause high blood

pressure

Electrolytes

Minerals

*Helps regulate
water in the
body*

*Helps transmit
nerve impulses
so cells can
communicate*

Mostly stored in cells.

Need approx. 4.7 grams/day

*Found in many fruits and
vegetables, especially*

*bananas, oranges, sweet
potatoes, and cantaloupe.*

*Can be found in meat,
dairy, or soy products.*

Abbreviated K

*Necessary to help prevent
osteoporosis, hypertension,
weakness and fatigue.*

Venn Diagram

