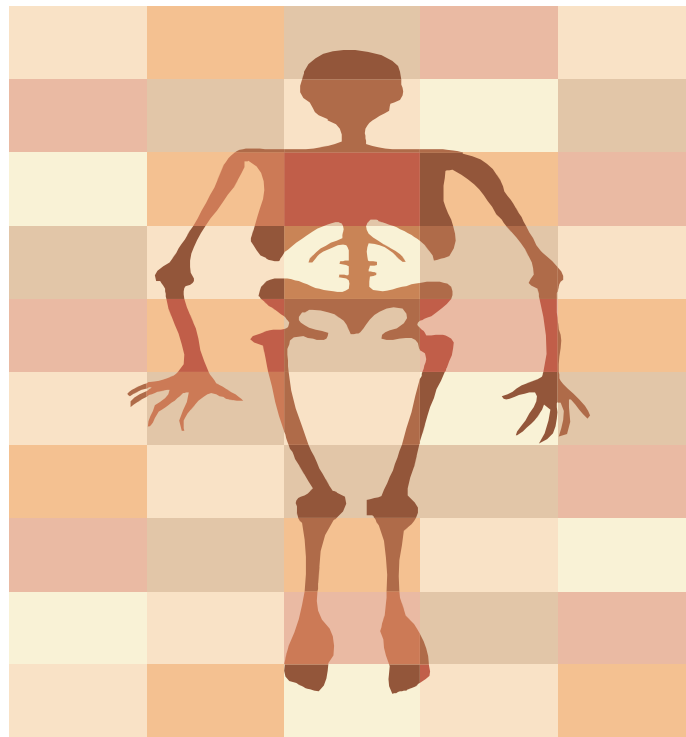


**Young Scholars
Summer School
Grades K-2**



Systems – The Human Body

Systems – The Human Body



Standards

Mathematics

- 2.25 The student will identify, create, and extend a wide variety of patterns, using numbers, concrete objects, and pictures.
- 2.26 The student will solve problems by completing a numerical sentence involving the basic facts for addition and subtraction. Examples include $3 + \underline{\quad} = 7$, or $9 - \underline{\quad} = 2$. Students will create story problems using the number sentences.

English

- 2.5 The student will use meaning clues and language structure when reading.
- a) Use information in the story to read words.
- 2.7 The student will read fiction and nonfiction, using a variety of strategies independently.
- a) Preview the selection by using pictures, diagrams, titles, and headings.
- b) Set purpose for reading.
- c) Read stories, poems, and passages with fluency and expression.
- d) Reread and self-correct when necessary.
- 2.8 The student will read and demonstrate comprehension of fiction and nonfiction.
- a) Make predictions about content.
- b) Read to confirm predictions.
- c) Relate previous experiences to the topic.
- d) Ask and answer questions about what is read.
- e) Locate information to answer questions.
- 2.9 The student will demonstrate comprehension of information in reference materials.
- a) Use a table of contents.
- b) Use pictures and charts.
- 2.11 The student will write stories, letters, and simple explanations.
- a) Generate ideas before writing.
- b) Organize writing to include a beginning, middle, and end.
- c) Revise writing for clarity.

Science

- 2.5 The student will investigate and understand that living things are part of a system. Key concepts include
- a) living organisms are interdependent with their living and nonliving surroundings

Concept: Systems

Topic: The Human Body

Parallel

Core Curriculum – The students will study the concept of the core parallel systems. The students will use core skills of analyzing, observing, hypothesizing, determining importance, and questioning. Students will learn how to compare and contrast information, categorize, and draw conclusions.

Parallel of Practice – This parallel emphasizes the role and practice of a nutritionist. Students will a nutrition and exercise program for a specific client and investigate the relationships found among human body systems and fitness goals. This parallel also emphasizes the role of a scientist. Students will generate and test hypotheses like a scientist.

Parallel of Connection – This parallel will be addressed by studying the macroconcept of systems. The generalizations about systems are developed and applied in the study of the human body.

Parallel of Identity– Students apply critical and creative thinking skills in researching an aspect of human body systems as it applies to them.

Essential Understandings

Systems are made up of a group of interacting elements.
Systems have boundaries.
Most systems receive inputs from outside their boundaries and give off outputs to the environment outside their boundaries.
Systems interact with other systems.
Systems may be described by their structures and functions.
Systems receive input that shapes and defines them.

Essential Questions

What is a system?
What are the structures and functions of the human body system?
What elements, systems, and boundaries make up the human body system?
How do elements and systems interact with each other to shape the behavior of the human body system?
How do the elements and systems interact with outside input to shape the behavior of the human body system?
What are structures and functions of systems of attributes?
What are structures and functions of number systems?

Knowledge and Skills

Students will be able to:
analyze systems according to structures and functions (elements and interactions).
articulate in oral and written form how and why systems work (their functions and purposes).
evaluate the productivity of a given system.
demonstrate how systems interact with each other and change in response to these interactions and input.

Assessment Evidence

Journal Reflections

Pre/Post assessments: Concept/ Reading/ Math

Anecdotal Records

Culminating Project

Learning Activities

Critical/ Creative Thinking

Graphic Organizers
Group Investigation
Logical problem solving strategies
Attribute block manipulation and analysis
Hundred number board analysis
Generating and Testing Hypotheses
Statistical and data analysis
Drawing conclusions
Categorizing and classifying concepts

Infusing Global Perspective

Trade Books
Writing Lessons

Additional Learning Activities

Morning Meetings
Field trip
Read Aloud

Lesson 1

What is a System?



Morning Meeting

Rationale	Lesson Sequence
<p>Beginning summer school with activities to introduce students to each other helps establish a sense of community. Starting each day with a classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>The classbuilding activities provided with this unit are from the book, <i>Classbuilding</i> by Miguel Kagan, Laurie Kagan, and Spencer Kagan. The directions for each structure as well as other ideas for your classroom are provided at the end of the unit.</p> <p>Corners was selected to allow students to foster acceptance among each other by celebrating individual differences. This activity helps students to realize they can be accepted while making choices that are different from peers.</p>	<p>Welcome</p> <p>Discuss class rules for the summer.</p> <p>What is Young Scholar?</p> <p>Establish routines/procedures.</p> <p>Class Building Activity: Corners</p> <p>Announce the alternatives for each corner of the room. “Think about your favorite type of ice cream which of these would you select: Chocolate, Strawberry, Vanilla, or Mint Chocolate Chip.”</p> <p>Give students a moment of silent time to make their selection. Have them write the name of their choice on a slip of paper.</p> <p>Tell students to walk to their designated corner.</p> <p>Have them pair up with another student and discuss the reasons for their preferences. Give each student 30 seconds to discuss their reasons and then have them switch. If there is an extra student have one group form a group of three.</p>

Investigation

Rationale	Lesson Sequence
<p>During this initial discussion, set the expectations for these group investigations. Teach the children how you expect them to listen and respond. Make sure the students know how to participate in a think-pair-share activity/discussion by practicing and modeling. Allow the students to respond to the teachers questions throughout this study using a think-pair-share format. By allowing students time to think and pair, the quality of the sharing in the group discussion improves. You may also choose to use think-write-pair-share to increase individual accountability. Emphasize the importance of listening to others and the importance of taking risks and sharing ideas.</p> <p>Students will understand the concept of systems by investigating human body systems. A pre-assessment of the student understanding of the concept will help develop appropriate differentiated lessons, and a comparison of the pre-assessment with ongoing and post-assessments will convey the student's development of deeper understanding of the concept</p> <p>To help students categorize the examples written down you may use the following questions:</p> <ul style="list-style-type: none">• How could you categorize these ideas into groups?• What could you call each group?• Is there a different way you might categorize your examples? <p>Essential Questions:</p> <ul style="list-style-type: none">• What is a system?• What are the structures and functions of the human body system?• What elements, systems, and boundaries make up the human body system?• How do elements and systems	<p>Distribute the Pre-Assessment on Systems (Appendix A) to students and give them time to complete.</p> <p>Divide the students into groups and provide each group with a piece of chart paper and marker. Ask students to brainstorm a list of systems by writing examples on the chart paper. Use Kagan's cooperative learning structure Roundtable to have kids brainstorm ideas. In Roundtable students work in groups of four and brainstorm a list on one piece of paper, each student writing one answer and then passing the chart paper and the marker to the student on his/her left. The chart paper and the marker literally goes around the table.</p> <p>After students have generated a list of examples ask students to share their examples with the class. Have groups categorize the examples into two or more groups using Marzano's Classification Graphic Organizer (Appendix B). Tell them to be prepared to explain the rules that govern membership in each category.</p> <p>After students have categorized their examples have them share with the class. Ask the students what some of the characteristics of systems are based on their examples and categories.</p> <p>Ask the students "What is a System?"</p> <p>Record the students' responses on chart paper. Using the Essential Questions lead students to the Essential Understandings.</p> <p>Post Essential Understandings in the classroom.</p>

<p>interact with each other to shape the behavior of the human body system?</p> <ul style="list-style-type: none"> • How do the elements and systems interact with outside input to shape the behavior of the human body system? • What are structures and functions of systems of attributes? • What are structures and functions of number systems? <p>Essential Understandings:</p> <ul style="list-style-type: none"> • Systems are made up of a group of interacting elements. • Systems have boundaries. • Most systems receive inputs from outside their boundaries and give off outputs to the environment outside their boundaries. • Systems interact with other systems. • Systems may be described by their structures and functions. • Systems receive input that shapes and defines them. 	
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Reading/Writing Focus

<p>Rationale</p> <p>The reading lessons throughout the unit focus on the strategy of determining importance in text. This specific lesson introduces students to the genre of nonfiction and compares the similarities and differences of nonfiction and fiction. Determining importance in text and the reading of nonfiction go hand in hand because readers of nonfiction have to figure out what is important in the text they read.</p> <p>Teachers should gather an assortment of fiction and nonfiction books that relate to human body systems prior to the lesson.</p>	<p>Lesson Sequence</p> <p>Distribute the Reading Pre-assessment (Appendix C) to the students.</p> <p>Hold up the fiction books you have set aside. Flip through the pages of some of them and read one aloud.</p> <p>Ask students to list some of the things that they noticed about the story. The following questions may help facilitate the discussion:</p> <ul style="list-style-type: none"> • What do you notice about the Pictures? • Who is this story about? • Could this really happen? <p>Record the students' responses on chart paper labeled Fiction. Tell students that this type of book is called a fictional book and tells a story that is made up.</p> <p>Next, hold up a nonfiction text and flip through the pages. Read aloud a nonfiction book.</p>
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	<p>Ask students, “What do you notice about this type of text?” The following questions may help facilitate the discussion:</p> <ul style="list-style-type: none">• What do you notice about the illustrations?• Who or what is this story about?• Could this really happen? <p>Record the students’ responses on chart paper labeled Nonfiction. Tell students that this type of book is called a nonfiction book.</p> <p>Explain that nonfiction books are organized around specific topics, main ideas, supporting details, and they contain true information.</p> <p>Show students a variety of fiction and nonfiction books. Have students verbalize characteristics of each book and decide whether or not it is a fiction or nonfiction book. Record the attributes of nonfiction and fiction books on a chart.</p> <p>Have students work in partners to review fiction and nonfiction books. As they find characteristics of each book have them write them down.</p> <p>Have students share findings as a class and record the features found on a Nonfiction Convention chart. Have students provide a description and purpose for each convention. An example of nonfiction conventions is provided in Appendix D.</p> <p>Ask students if a non-fiction book is an example of a system. Have them provide elements, boundaries, inputs, outputs, and interactions.</p>
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Mathematics Focus

Rationale	Lesson Sequence Distribute the Math Pre-assessment (Appendix E) to students.
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Read Aloud

Teacher's Choice

Comments

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Lesson 2

How is a Vivarium a System?



Morning Meeting

Rationale

Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.

Find-Someone-Who allows all students to be actively involved. This structure also allows students who at first knew none of the answers, after completing one or two answers, become a resource for others because they are now “someone who knows.” There are several Find-Someone-Who worksheets available in the appendix. You may select whichever one meets your classroom needs or you may create an original.

Lesson Sequence

Class Building Activity: Find Someone Who

With worksheets in hand (Appendix F), students mingle through the room until they find a partner.

When they find a partner they can ask each other questions from the worksheet until they find a question their partner knows the answer to.

When your partner tells you the answer write it in the box in your own words on the Find Someone Who form and then have your partner sign your form.

Reverse Roles.

Have students circulate around the room to find another partner.

Investigation

Rationale	Lesson Sequence
<p>Students will understand the concept of systems by investigating vivariums and classrooms as a system.</p>	<p>Ask students if they have heard the word “system” and ask for examples. Record examples on board or chart paper. Divide students into small groups. Give each group a copy of the “Vivarium System” (Appendix G) and explain that the vivarium is an example of a system. Students illustrate and label the vivarium and discuss what things are in it, what must go into it regularly, and what comes out of it. If possible, students may observe an actual vivarium as they complete the activity.</p> <p>Meet back together as a whole group for students to share what they included in their vivarium systems. Explain that we can define these five things about systems:</p> <ul style="list-style-type: none">• Elements• Boundaries• Inputs• Outputs• Interactions <p>The following probing questions can help students understand each of the terms:</p> <ul style="list-style-type: none">• What are the parts of the vivarium? (the container, sand, hiding places, crickets, petri dishes, air holes, etc) What lives in a vivarium? (crickets, etc) What other things have to be in the vivarium for crickets to live? (food, water, oxygen) All of the things that are parts of the vivarium and what belongs in it are called elements.• What keeps the elements of the vivarium together? (the sides, bottom, and top of the container) What are the edges or boundaries of the system? (the sides, bottom, and top of the container)• What things go into the vivarium from the outside? (food, water, air, more crickets, hiding places, other objects) What are some things that have to be added to the vivarium regularly to keep the crickets alive?

	<p>(food, clean water) The things that are put into a system to keep it going are called inputs.</p> <ul style="list-style-type: none"> • What things come out of the vivarium and its elements? (more crickets may be produced and taken out for other vivariums, cricket excrement, dead crickets) The things that a system produces or lets out are called outputs. • What are some of the things that happen in the vivarium to use the inputs and produce the outputs? (the crickets eat, grow, molt, lay eggs, and die) What do the crickets do to use the inputs and give off outputs? (eat, breathe) The things that happen in a system to use the inputs and give off the outputs are called interactions. <p>Tell students that there are many different kinds of systems. Ask students whether they think their classroom is a system. Students work in groups to complete “Systems Diagram” (Appendix H), identifying some of the elements, boundaries, inputs, outputs, and interactions of the classroom system. Some suggested responses include:</p> <ul style="list-style-type: none"> • Elements: students, teacher, desks, books, chalkboard, pencils, computer, etc. • Boundaries: walls, windows, door, daily schedule, etc. • Inputs: information, experiences, papers, visitors, etc. • Outputs: projects, presentations, test results, etc. • Interactions: conversations, learning, teaching, sharing, etc.
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Reading/Writing Focus

<p>Rationale</p> <p>This lesson is designed for students to identify and understand the purpose of the organizational features used in nonfiction texts, such as labels, photographs,</p>	<p>Lesson Sequence</p> <p>Distribute the typed paragraph on the digestion system (Appendix I) that you prepared prior to the lesson and ask the students to read the paragraph and record</p>
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captions, headings, maps, etc. In a later lesson students will apply the conventions of nonfiction texts to their own writing by incorporating them into the design of a two-page spread about a specific body system.

as much information as they can about the topic in five minutes.

Next, distribute the sample two-page (Appendix I) spread that presents the same information as in the typed paragraph but uses conventions found in nonfiction text such as photographs, labels, captions, etc. Give students another five minutes to gather information from this page.

Gather the students together and discuss as a class which page was more interesting to read and more effective in relaying information. Have students provide you with specific reasons why the two-page spread was more accessible.

Allow students time to browse through nonfiction books. After ample time gather the students together and discuss features of the books. Have students share with the class features that helped organize the book, made the book interesting, or caught their attention. Record the students' responses on the Nonfiction Convention Chart created the previous lesson.

After students have reviewed a variety of books have them complete the Fiction Nonfiction Comparison Matrix (Appendix J) on fiction and nonfiction books.

Mathematics Focus

Rationale	Lesson Sequence
<p>The lessons throughout the first two weeks focus on statistics and data analysis. Graphing was specifically chosen to compliment the investigating sections of the unit. Many of the investigations utilize experiments in which it is important to analyze the data to draw conclusions.</p> <p>This first lesson was specifically designed to reactivate students' prior knowledge on graphing.</p>	<p>Tell the students that we will be learning about graphs today so that we can graph results of experiments conducted later this week. Have students brainstorm a list of various graphs.</p> <p>Distribute a small package of M & M's to each student. Instruct them not to touch the package.</p> <p>Have the students estimate how many "M&M's"® Candies are in their bags and write their estimate on the top of their "M&M's"® Candies Graphing worksheet (Appendix K).</p> <p>Next, have the students estimate how many of each color they will get in their bag and write their estimation down on "M&M's"® Candies Graphing worksheet. Make sure their total prediction for all colors matches their estimate count of "M&M's"® Candies in their bag. (For example, a student predicts there are 10 "M&M's"® Candies in their bag. They predict there are 3 red, 1 orange, 2 yellow, 1 green, and 3 brown. When these are added together they should total 10.)</p> <p>Finally, let the students open their bags (They are not allowed to eat any until this part of the activity is over!) Have the students record their actual total and actual total of colors on the "M&M's"® Candies Graphing Worksheet.</p> <p>Select a specific color to graph as a class. For example, ask all of the students for the number of green "M&M's"® and create a class bar graph. Make sure you review all of the parts that should be included on a bar graph.</p> <p>Have students create a bar graph for the number of "M&M's"® candies for each</p>

	<p>specific color in their package.</p> <p>Ask students if a bar graph is an example of a system. Have the students identify some of the elements, boundaries, inputs, outputs, and interactions of a bar graph. Some suggested responses include:</p> <ul style="list-style-type: none">• Elements: bars, titles, scale, vertical axis, horizontal axis, labels, etc.• Boundaries: vertical axis, horizontal axis, etc.• Inputs: data, numbers, information, etc.• Outputs: information, knowledge, relationships, conclusions, etc.• Interactions: insight, learning, teaching, sharing, thinking etc.
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Read Aloud

Teacher's Choice

Comments

Lesson 3

Is the Food Pyramid a System?



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Guess-the-Fib was selected to help students get to know each other and to allow students to share more personal information about each other. Guess-the-Fib is a fun game that promotes a positive classroom environment.</p> <p>Two worksheets are provided that you could use to have students write down their statements. (Appendix L)</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity: Guess-the-Fib</p> <p>Have each student write three statements. Two of the statements should be unbelievable facts and one statement should be believable fib.</p> <p>One student is randomly selected to read his/her statements to the class.</p> <p>Teams put their heads together to reach consensus on which one of the three statements is the fib. For a team to vote you must reach a consensus.</p> <p>The student presenting the statement asks how many teams guessed statements one, two, and three. Teams respond by raising their hands. Teams that did not reach a consensus do not respond.</p>
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Investigating

<p>Rationale</p> <p>This lesson is designed to familiarize students with the food pyramid to assist them in developing their menus for their culminating project.</p> <p>Pictures of healthy and non healthy items have been provided in Appendix M. However, you may select your own pictures to use or bring in actual food examples.</p> <p>The following websites provides a lot of informative information about the food</p>	<p>Lesson Sequence</p> <p>Tell the students that they are going to act like detectives to solve a mystery. Explain that they are going to try and figure out how items placed in a “yes” group are similar. Explain that all of the items in the “yes” group share a common attribute. Tell them that items that do not have this attribute will be placed in the “no” column.</p> <p>Present one item at a time under the “yes” and “no” signs. Present the clearest example first in both columns. After placing</p>
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pyramid for kids and professionals:

<http://www.mypyramid.gov/>

http://www.kidshealth.org/kid/stay_healthy/food/pyramid.html

During Math students will compute the amount they ate from each food group and compare it to the recommended amounts. It would be beneficial to complete the math lesson after the investigating lesson.

several items in each category ask the students where they think the next item that you show goes, in the “yes” or “no” column. If students are unsure you can place it in a neutral category and come back to it at a later time.

After about six examples in each category ask the students, “What is the same about the examples in the “yes” column? What attributes do the “yes” examples share?” List the attributes where all students can see. List all the suggestions even if they are wrong. If the students name the concept, healthy foods, as an attribute ask, “What makes the examples fit that category?”

Once students have defined the concept have them provide examples for the “yes” category. Ask students to draw a picture of an example that would belong in the “yes” category and one that would belong in the “no” category.

Ask students to define healthy foods. Ask students to list some of the examples of healthy foods they eat in their everyday life.

Ask students why healthy foods are important. Tell students that we will be learning about the Food Pyramid and comparing the foods we eat with it.

Have students record what they ate the previous day on the My Food Pyramid worksheet (Appendix N).

Share with students the MyPyramid Poster (Appendix O).

Have students analyze the picture of the food pyramid to infer the symbolism. Use the Anatomy of the Food Pyramid (Appendix P) to help explain what the different pictures mean as well as the following questions:

- Why do you think they have a picture of a person climbing the steps?

The fitness goals for the culminating project include: building strength, endurance, flexibility, and balance. You want to highlight what foods may help with each fitness goal. For example, eating pasta from the grain food group will help provide you with more endurance. A later lesson in the unit will discuss proteins, carbohydrates, and fats.

- Why are the colored stripes wider at the bottom of the pyramid?
- Why do you think some of the color stripes are wider than others?
- Why do you think they use a variety of colors?

Ask the students if the food pyramid is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

As a class complete the Food Group Chart (Appendix Q) with students. This chart will serve as an aid when students develop their menus for their clients.

Introduce the culminating project to the students. Explain that they will be hired as a nutritionist for a specific client. Their job will be to develop an exercise plan and a menu to help their client reach his/her goal. The fitness goals may include one or several of the following: increasing endurance, flexibility, strength, and balance.

Ask students how specific foods could help in reaching the described fitness goals.

Sample Responses:

- Meat and dairy products are high in protein and help keep your muscles strong. Good sources include eggs, meat, fish, poultry, cheese, milk and yogurt. Peanut butter, tofu, nuts, and seeds are also high in protein.
- Bread, cereal, rice, and pasta give you long-lasting energy. Good choices include whole-wheat bread, bagels, pasta, pretzels and crackers; oatmeal and high-fiber cold cereals; brown or wild rice; and corn tortillas.

As a class complete the Fitness Goals Chart (Appendix T)

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Reading/Writing Focus

Rationale	Lesson Sequence
<p>The idea for nonfiction convention notebooks came from <i>Reading with Meaning</i> pp.148-150. This lesson was developed to continue to familiarize students with the organizational features found in nonfiction text and their purpose.</p> <p>Students will need to bring a photograph from home prior to the lesson.</p>	<p>Create nonfiction convention books for students by stapling together 6-10 sheets of 8 x 11" paper folded over and stapled together.</p> <p>Paste a photograph that you brought to class on the first page of your notebook and write a caption below it. For example, you could have selected a photograph of you with a sibling and written "Here I am with my sister Christina vacationing in Charleston." Label this page of your convention notebooks "Caption".</p> <p>Students should create the cover page of their book by pasting the photograph brought from home. If students did not bring a photograph from home they can illustrate a picture and write a caption.</p> <p>Explain to students that they will continue to add features of nonfiction books into their Conventions notebook throughout Young Scholars. Whenever they come across a nonfiction convention they should record the example into their notebook. If it is an unfamiliar nonfiction feature they should share it with the class and add it to the two column chart titled, Nonfiction Conventions.</p> <p>Each day as you read a nonfiction book to the class you should add a new feature to your own Convention Notebook.</p>

Mathematics Focus

Rationale	Lesson Sequence
<p>The following website helps determine the amounts of each food group kids need depending on age, gender, and activity level. If time permits students could determine their personal amount. If not, the amounts given are an estimated amount for the age, gender, and activity level.</p> <p>http://www.mypyramid.gov/mypyramid/index.aspx</p>	<p>Explain to the students that the amount of food to eat from each group depends on several factors. Some of the factors are your age, your gender, and your activity level. The following amounts are good estimates of how much of each food group they should be eating to stay healthy:</p> <p>Grains: grains are measured in ounce equivalents. Ounce equivalents are a way</p>

It will be helpful to show students how much a cup and a ½ of cup is. You could have students actually pour in amounts of pasta, rice, or cereal so they can visualize the amounts when computing how much they ate the previous day.

to show a serving size. Some ounce equivalents for common grain foods are 1 ounce equivalent equals:

- 1 piece of bread
- ½ cup of cooked cereal, like oatmeal
- ½ cup of rice or pasta
- 1 cup of cold cereal

Vegetables: Vegetable servings are measured in cups.

- 9 to 13 year old girls need 2 cups of veggies each day
- 9 to 13 year old boys need 2 ½ cups of veggies each day

Fruits: Fruit servings are measure in cups.

- 9 to 13 year old girls need 1 ½ cups of fruits each day
- 9 to 13 year old boys need 1 ½ cups of fruits each day

Milk and other calcium-Rich Foods: milk servings are measure in cups.

- 9 to 13 year old girls need 3 cups of milk (or another calcium-rich food) each day
- 9 to 13 year old boys need 3 cups of (or another calcium-rich food) each day

Meats, Beans, Fish, and Nuts: are measured in ounce equivalents, an ounce equivalent of this group would be:

- 1 ounce of meat, poultry, or fish
- ¼ cup cooked dry beans
- 1 egg
- 1 tablespoon of peanut butter
- A small handful of nuts or seed
- 9 to 13 year old girls need 5 ounce equivalents each day
- 9 to 13 year old boys need 5 ounce equivalents each day

Have students compute the number of servings eaten for each specific food group and record it on the My Pyramid worksheet (Appendix N). Have students record the estimated amount of servings to stay healthy on the worksheet. Have students compare the amounts. Did they eat healthy? Did they have too much of one food group? Did they have not enough of another food group?

Using the My Food Pyramid worksheet completed have students compare and contrast using the Venn Diagram (Appendix R) the foods eaten verse the food pyramid. Create a healthy menu for themselves for the day. The menu should include breakfast, lunch, dinner, and two snacks. They need to make sure that their new menus include the right amount of servings for each food group. When the menus are completed have students share with the class.

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Read Aloud

Good Enough to Eat: A Kid's Guide to Food and Nutrition (Hardcover) by Lizzy Rockwell
Eat Healthy, Feel Great (Hardcover) by William Sears, Martha Sears
Healthy Eating (Blastoff! Readers) (The New Food Guide Pyramid) by Emily K. Green

Comments

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Lesson 4

The Digestive System



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Inside/Outside Circle was selected as a fun activity for students to share personal information about themselves with classmates. This activity will allow students to get acquainted with each other and create a positive classroom atmosphere.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity: Inside/Outside Circle</p> <p>Have students stand in two concentric circles around the classroom. Both circles have the same number of students. Students in the inside circle each face a student in the outside circle.</p> <p>Have students from the inside circle share something with their partners for 1 minute. “Inside circle students share with your partner your favorite movie and why?”</p> <p>Students reverse roles and the partner on the outside circle shares their favorite movie with their partner.</p> <p>Have students face each other, make a right face and count out loud as everyone rotates three people. Have students face their new partner and repeat the process.</p>
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Investigation

<p>Rationale</p> <p>Students understand the concept of systems by investigating the human body as a system as well as the digestive system.</p>	<p>Lesson Sequence</p> <p>Show students a picture of a human body (Appendix S).</p> <p>Ask the students if the human body is an example of a system. If so, how?</p> <p>The following probing questions can help students understand each of the terms:</p> <ul style="list-style-type: none"> • What are the parts of the human body? (arms, legs, head, stomach,
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etc.) All of the things that are parts of the human body are called **elements**.

- What keeps the elements of the human body together? (skin, tendons, ligaments, bones, etc.) What are the edges or **boundaries** of the system? (skin)
- What things go into the human body from the outside? (oxygen, food, water, sunlight, knowledge, etc.) The things that are put into a system to keep it going are called **inputs**.
- What things come out of the human body and its elements? (carbon dioxide, waste, work, energy, etc.) The things that a system produces or lets out are called **outputs**.
- What are some of the things that happen in the human body to use the inputs and produce the outputs? (digestion, breathing, etc.) The things that happen in a system to use the inputs and give off the outputs are called **interactions**.

Explain to the students that we will be investigating various systems of the body.

Ask students if they can name any systems found within the body. Record responses on the chalkboard.

Tell students that we will be learning more about the following systems: digestive, nervous, muscular, respiratory, and cardiovascular.

Explain that today we will focus on the digestive system.

Ask the students what they know about the digestive system. Complete a KWL chart on the digestive system.

Tell the students digestion is what the body does when it takes in food, absorbs it, and uses the food to produce energy, and muscles, and bones.

Ask the students, "Where do you think digestion begins?" Record the students' responses on the chalkboard.

Give each child a saltine. Ask students what they think is the function of the teeth. Record the students' responses.

Have students take a bite of the cracker paying attention to the role of the teeth. Explain that the teeth bite the food, making the food an acceptable size for the mouth to handle.

Instruct the students to take another bite of the cracker but tell them their tongue has to stay pushed down to the bottom of their mouth.

Discuss as a class whether or not it was difficult to eat the cracker without moving or using their tongue. Ask students what they think is the function of the tongue. Record the students' responses.

Explain to the students that the tongue helps move the food around in the mouth before being swallowed and the tongue also tells us what the food tastes like.

Have the students take another bite from the cracker and chew until you tell them to stop. After 30 seconds have them swallow the cracker.

Ask whether their mouths were wet or dry? Discuss where this juice is coming from and that saliva is the first digestive substance that mixes with the food to begin the digestion process.

Distribute another saltine cracker to each student. Have the students take a bite and ask them how it tastes.

Instruct the students to take another bite and chew until you tell them to stop. After 30 seconds ask the students how the cracker tastes (the cracker should taste sweeter as the saliva breaks the starch into sugar.)

A list of books on the digestive system can be found at the end of the lesson.

This chart will help students complete their culminating projects. We want students to begin to make connections between the interactions of the body system and the fitness goals. There are more connections between some systems than others.

Explain that after the food goes into the mouth and is broken down by the saliva it is squeezed down the esophagus and into the stomach. The stomach squeezes and churns the food and adds more liquid to further break down the food. When the food is sufficiently broken down, it moves into the small intestine, where the nutrients are absorbed and used by the body. Foods we cannot digest, wastes, move into the large intestine and out of the body.

Show the students a diagram of the digestive system reviewing the various parts. (Appendix S)

Read a book on the digestive system.

Ask the students what parts are in the digestive system and what the functions of each part are. Record the students' responses.

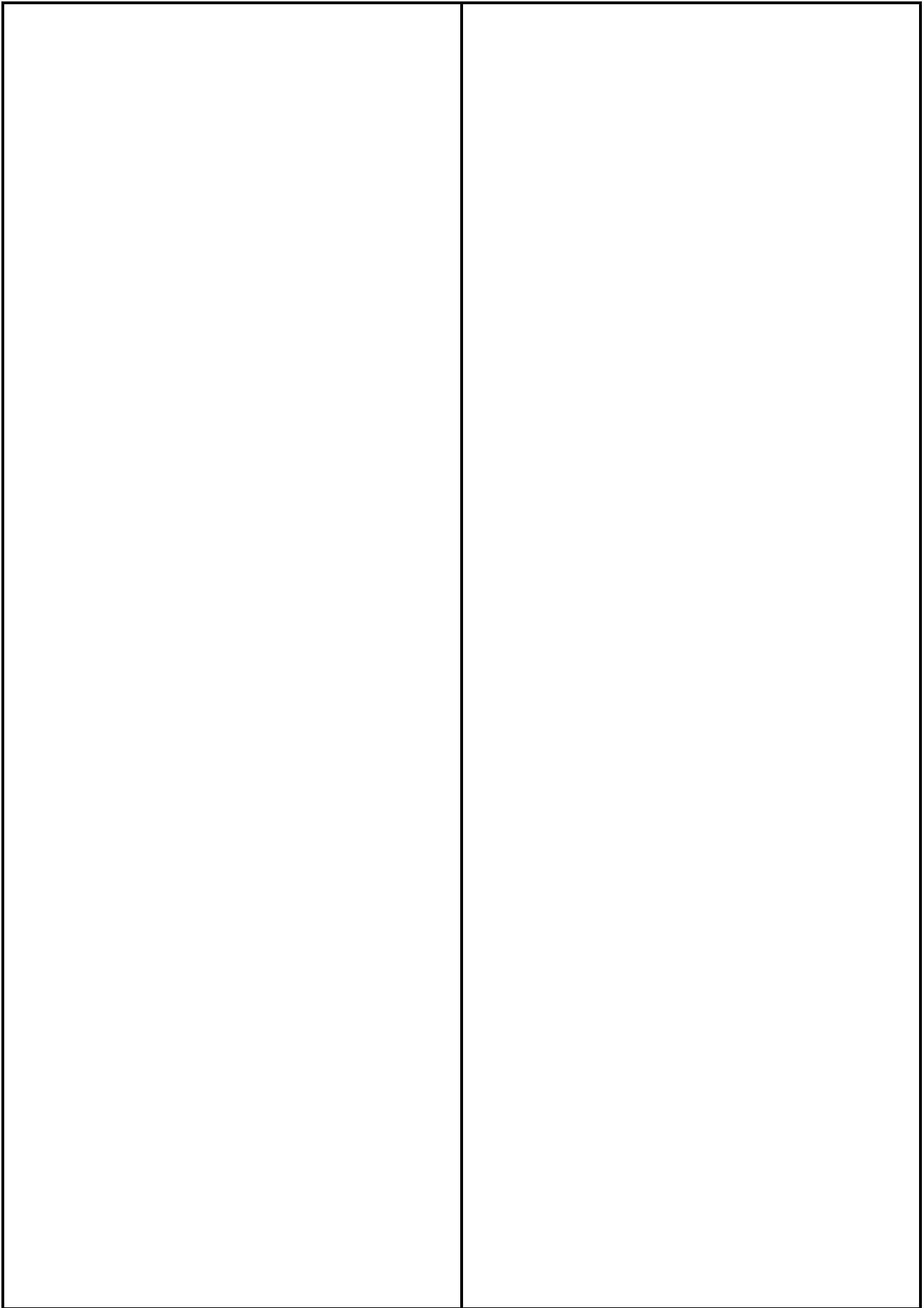
Ask the students if the digestive system is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

Ask the students how the digestive system interacts with the fitness goals of endurance, strength, flexibility, and balance.

Sample Responses:

- Any problems with chewing, swallowing, and digestion may lead to malnourishment.
- Absorbs food to maximize nutrition
- Choose foods for specific goals (endurance carbohydrates, protein for strength, etc.)

Complete the Fitness Goals Chart (Appendix T) as a class.



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Reading/Writing Focus

Rationale	Lesson Sequence
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This lesson was created to have students write nonfiction books that contained the conventions previously studied. Students will be asked to become a specialist on a favorite topic and select what is important to include in a piece of informational writing.

You can create a construction paper book that contains several pages of paper for students to write their teaching books.

The teaching books will take several days to complete.

Remind the students that the purpose of nonfiction books is to teach something. Explain that everyone is a specialist in something.

Ask students what a specialist is. Record the students' responses on chart paper.

Create a list of topics in which you are a specialist.

Select one of the topics listed to model writing your own teaching book.

Explain that since the purpose of your book is to teach something you must decide what the most important information is to include in your book.

Model writing several pages of your book and include nonfiction conventions on each page.

Have students write their own nonfiction teaching books. After students have finished writing their books have them share them with the class.

Mathematics Focus

Rationale	Lesson Sequence
	<p>Show students the completed bar graph of the number of green M & M's in each students' package.</p> <p>Ask the students if they were to pick one number that could best describe all the data in the graph, what number would they pick? Why?</p> <p>Introduce the following vocabulary to the students: mean, median, and mode.</p> <p>Mode-- The mode of a set of data is the value in the set that occurs most often.</p> <p>Median—The Median is the number that falls exactly in the middle when you arrange the numbers in order from least to greatest.</p> <p>Mean-- The mean is the most common measure of average. It is found by adding all the numbers in a set and then dividing by how many numbers there are.</p> <p>Explain to the students that although the mean, median, and mode can be figured for almost any set of data, there are times when one of these measures is better than the others:</p> <p>Write the following numbers on the board: \$27,000 \$29,000 \$33,000 \$34,000 \$35,000 \$39,000 \$5,000,000</p> <p>Tell the students that the numbers in the set represent the salaries of seven individuals who graduated from a local university with degrees in psychology.</p> <p>Divide the class into two groups. Have one</p>

group determine the mean and one group determine the median.

Have the two groups share the mean and median. Ask the students why the two numbers are drastically different.

Explain that the \$5 million salary is what we call an “outlier”. Ask the students what number you would use if you were trying to give prospective psychology majors an accurate picture of what they could expect to earn after graduation. What number would you use if you were trying to attract more students to your university?

Tell students that when someone reports an “average” value it is important to understand that he might be talking about the mean, median, mode depending on what kind of impression he wants to make.

Ask students if you wanted to determine an accurate representation of data when it would be best to figure the mean, the median, or the mode.

Mean: figure the **mean (average)** with sets of data that do not have very high or low numbers.

Median: figure the **median** with sets of data with a couple of numbers that are much higher or lower than most of the other numbers.

Mode: figure the **mode** with sets of data that have many identical numbers.

Have students compute the mean, median, and mode using the data from the graph of green M&M’s in each package.

Which method of central tendency gives a more accurate representation?

Read Aloud

Digestion (Your Body and Health) (Library Binding) by Jen Green

My Stomach (Pebble Books) (Hardcover) by Carol K. Lindeen

What Happens to a Hamburger? (by Paul Showers and Edward Miller

Comments

Lesson 5

The Nervous System



Morning Meeting

Rationale	Lesson Sequence
<p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Line-Ups was selected to promote individual differences and foster acceptance among classmates. Line-ups allow students to hear varying perspectives that differ from their own.</p>	<p>Classbuilding Activity/Line-ups</p> <p>Announce a dimension upon which students vary. “Line up by the number of syllables in your name. Students with the least number of syllables should start at this end and the students with the greatest number of syllables should be at this end.”</p> <p>Have students position themselves in the line-up by finding where they stand relative to their classmates.</p> <p>Have students pair up with the student next to them to discuss, “What do you like best and least about your name.”</p> <p>Give each partner a designated amount of time to share and have students switch roles.</p>

Investigation

<p>Students understand the concept of systems by investigating the nervous system.</p>	<p>Review the digestive system with the students. Tell the students that today we will be learning about another system, the Nervous System.</p> <p>Ask the students what they know about the nervous system. Complete a KWL chart on the nervous system.</p> <p>Explain to the students that the nervous</p>
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Some titles are included at the end of the lesson or you may select your own book.

The Stroop Effect experiment came from the following website:

<http://faculty.washington.edu/chudler/words.html>

If a computer lab is available you may have your students complete the experiment on computers.

In psychology, the Stroop effect is a demonstration of interference in the reaction time of a task. When a word such as blue, green, red, etc. is printed in a color differing from the color expressed by the word's semantic meaning (e.g. the word "red" printed in blue ink), a delay occurs in the processing of the word's color, leading to slower test reaction times and an increase in mistakes. The effect is named after its discoverer, John Ridley Stroop, and was first noted in an article Studies of interference in serial verbal reactions published in the Journal of Experimental

system is a very complex system in the body. It has many parts and is divided into two main systems, the central nervous system (CNS) and the peripheral nervous system (PNS). We are going to focus on the central nervous system. The spinal cord and the brain make up the central nervous system. Its main job is to get the information from the body and send out instructions. The brain keeps the body in order. It helps control all of the body systems and organs. The brain allows us to think, feel, remember, and imagine. The brain communicates with the rest of the body through the spinal cord and the nerves. The spinal cord runs down a tunnel of holes in your backbone. The bones protect it from damage. The cord is a thick bundle of nerves, connecting your brain to the rest of your body.

Show the students a diagram of the nervous system reviewing the various parts. (Appendix S)

Read a book on the nervous system.

Ask the students if the nervous system is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

Ask the students what parts are in the digestive system and what the functions of each part are. Record the students' responses.

Display the Stroop Effect Word Set #1 (Appendix U) Tell the students that they will say the color of the word, not what the word says. For example, for the word, **RED**, you should say "blue."

Have students work in pairs to read the words on set #1. One student should use a stop watch to time the other student and then switch roles.

Students should record the time it takes them to complete the list under Trial 1 on

<p>Psychology in 1935. <i>From Wikipedia, the free encyclopedia</i></p> <p>It would be beneficial to complete the math lesson right after the investigation lesson.</p>	<p>the Stroop Effect Data worksheet (Appendix U).</p> <p>Display the Stroop Effect Word Set #2 (Appendix U). Tell the students that they will say the color of the word, not what the word says. For example, for the word, RED, you should say “blue.” Have students work in pairs to read the words on set #1. One student should use a stop watch to time the other student and then switch roles.</p> <p>Record the time it takes them to complete the list under Trial 2 on the Stroop Effect Data worksheet (Appendix U).</p> <p>Tell the students that we will analyze and draw conclusions from the data during math.</p>
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Reading/Writing Focus

<p>Rationale</p> <p>The idea for this lesson was taken from <i>Strategies that Work</i> pp. 131-132. The purpose of the lesson was for students to understand that there are often several important ideas in a piece of text rather than a single main idea. Helping students to find important information will assist them in the research phase of this unit.</p>	<p>Lesson Sequence</p> <p>Distribute three sticky notes to students, each one coded with a *.</p> <p>Distribute a piece of text to students and instruct them to place the sticky notes at three different locations in the text that they deem important.</p> <p>Have the students gather together and share what they deemed to be important in the text. Obviously, students will have different information marked. The point is to show students that there is often more than one important idea in anything we read. Have students defend their selection and explain the reasoning behind their decision.</p>
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Mathematics Focus

<p>Rationale</p> <p>Instead of having one class bar graph for each trial you could have the students use the data from the Stroop Effect Worksheet to create his/her own bar graphs using the four data results collected. You could also</p>	<p>Lesson Sequence</p> <p>As a class create a bar graph using the time it took to complete the experiment in trial #1 and a second bar graph for the time it took to complete the experiment in trial #2.</p>
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create a double bar graph instead of two separate graphs to help students visually see the differences among the trials.

Have students compute the mean, median, mode, of the Stroop Effect results in trial #1 and trial #2..

As a class draw conclusions from the data. Why do they think it took longer to read the second word set? Ask the students if it would be easier for a very young child or an adult to complete this experiment. Why? Would it be easier or more difficult for a child who cannot yet read? Why?

There are two theories that may explain the Stroop effect:

Speed of Processing Theory: the interference occurs because words are read faster than colors are named.

Selective Attention Theory: the interference occurs because naming colors requires more attention than reading words.

Read Aloud

The Nervous System (Human Body Systems) (Library Binding) by Rebecca Olien
What's Inside Me?: My Brain (What's Inside Me?) (Library Binding) by Dana Meachen Rau
The Nervous System (Human Body Library) (Library Binding) by Martha V. Gold

Comments

Lesson 6

The Nervous System



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Similarity Groups was selected as an energizer to allow students to learn more about their classmates.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/ Similarity Groups</p> <p>Tell students to think about their favorite season. Have students write down their favorite season on a piece of paper.</p> <p>Have students get up and move about the class, grouping with those of a similar response.</p> <p>Once students are in groups have them break into pairs to discuss what they like most about the season.</p>
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Investigating

<p>Rationale</p> <p>Students understand the concept of systems by investigating the nervous system.</p>	<p>Lesson Sequence</p> <p>Review with students what we learned about the Nervous System the previous lesson.</p> <p>Explain that the nervous system is also responsible for our memory.</p> <p>Tell the students that you will conduct a memory test. Explain that you will show several letters for 3 seconds. After you show the letters you will instruct students to write down as many letters as they can remember on the Short Term Memory Test data sheet (Appendix V).</p>
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<p>It would be beneficial to complete the math lesson prior to the investigation.</p>	<p>Complete the experiment 6 times using the Short Term Memory Test Letters (Appendix U).</p> <p>Tell the students that you will analyze and draw conclusions from the data during math.</p>
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Reading/Writing Focus

<p>Rationale</p> <p>The idea for this lesson came from <i>Strategies that Work</i> pp. 134-137. The purpose of the lesson was to help students differentiate between key topics and supporting details. The topic/details note-taking strategy will help students organize their thinking as they read for information for their culminating project.</p> <p>An article on the Digestive System is provided (Appendix W), however, you may select another article for your students to complete the activity.</p>	<p>Lesson Sequence</p> <p>Distribute an article to the students. (Appendix W). Explain to the students that the headings in the article represent the topics and that the text is full of details that provide information about the topic.</p> <p>Read the first section aloud to the students. Ask the students if they can infer the topic from the heading. If not, tell them you should look at the first couple of sentences to help you determine what the section is mainly about.</p> <p>On the left side of the paper write the topic determined. Then, include several important details outlined in the section.</p>
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Mathematics Focus

Rationale	Lesson Sequence
<p>To demonstrate this that the whole is related to its parts, teacher should cut a construction paper circle into various sized pieces. A Circle Graph Template (Appendix X) cut into various sized pieces is provided.</p>	<p>Reactivate students' prior knowledge by asking the class how they can illustrate the meaning of this statement, "A whole is equal to the sum of its parts." (Possible answers: all the sections together make one thing, the parts add up to one circle, the whole circle is divided into many parts).</p> <p>Distribute each piece of the circle to a student with a piece of tape.</p> <p>Have the students tape the pieces to the chalk board back in the shape of a circle one at a time.</p> <ul style="list-style-type: none">• Explain to the students that a circle graph compares parts of a whole. Display the example of Students' Favorite Snack Circle Graph (Appendix Y) on the overhead or copy to board. Tell the students that the whole circle stands for the 20 students surveyed. Each section of the circle stands for their favorite snack. Ask the following questions:• What fractional part of the students' favorite snack are cookies?• What fractional part of the students' favorite snack is candy bars?• What fractional part of the students' favorite snack is fruit?• What fractional part of the students' favorite snack is granola bars• What fractional part of the students' favorite snack is other? <p>Begin a discussion on circle graphs using the following questions:</p> <ul style="list-style-type: none">• Why do you think the sections of the graph are different sizes? (popular snacks get larger sections; less popular snacks get smaller sections)• Do you notice any interesting sections or other features in the graph? (For examples, 5 students out of 20 picked cookies-that's $\frac{1}{4}$ of the students- and you can see that

<p>Two circle graph templates are provided (Appendix Z). One template has the circles divided into sections based on the number of letters in each trial. The other template has circles that are not divided into sections. You may have students use whichever template meets their needs.</p>	<p>the cookie part is $\frac{1}{4}$ of the circle. The candy bar and fruit: half the students (10) picked one of those, and those two pieces together are half the circle.</p> <ul style="list-style-type: none"> • How do you think the graph was made? (one way would have been to divide the circle into 20 slices of the same size and then call 3 of these slices "Fruit," 7 of the slices "Candy Bar," and so on for the other snack choices. <p>Have the student make their own circle graphs depicting how many letters they remembered in each trial of the Short Term Memory Test.</p> <p>Compare results with the class. You may want to have each student cut out the circle being compared and tape it on the chalkboard. Write the fractional amount remembered below each circle or convert to a percentage. Draw conclusions.</p> <p>Make a bar graph for each trial that depicts the number of letters remembered by the number of students. Draw conclusions.</p>
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Read Aloud

The Nervous System (Human Body Systems) (Library Binding) by Rebecca Olien
 What's Inside Me?: My Brain (What's Inside Me?) (Library Binding) by Dana Meachen Rau
 The Nervous System (Human Body Library) (Library Binding) by Martha V. Gold

Comments

Lesson 7

The Nervous System



Morning Meeting

Rationale	Lesson Sequence
<p>Starting each day with a class morning meeting and classbuilding activities helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Mix-Freeze-Group was selected as an energizer to promote a positive classroom environment.</p>	<p>Classbuilding Activity/Mix-Freeze-Group</p> <p>Announce to the students to push in their chairs and stand. Tell everyone to start to mix through the classroom by making right turns, left turns, and about faces. Tell them to spread out around the whole classroom.</p> <p>Have students keep moving until you call “Freeze.” Then, students should freeze exactly where they are located.</p> <p>Provide a verbal statement so students know the size group to form For example, “How many syllables are there in Summer Vacation?” Say Group. Students should form groups of five according to the number of syllables in “Summer Vacation”.</p>

Investigation

Rationale	Lesson Sequence
<p>Students understand the concept of systems by investigating the nervous system.</p> <p>These are just two examples of sense experiments. If a teacher would like to conduct a different sense experiment he/she may choose to do so. The experiments were taken from the following website: http://faculty.washington.edu/chudler/chsense.html The Four Question Strategy utilizes the following questions:</p>	<p>Review with students what we learned about the Nervous System the previous lesson.</p> <p>Explain that the nervous system is also responsible for our senses.</p> <p>Complete one of the sense experiments below:</p> <p>Explain to students that they will be designing an original experiment on one of the senses. Lead students through the Four Question Strategy (Appendix AA) to design the experiments.</p>

- How do noses act?
- What materials are readily available for conducting experiments on the noses' influence on taste?
- How can you change the materials to affect the action?
- How can you measure or describe the response to the change?

After you have brainstormed as many actions as possible choose one action upon which you will focus. This lesson focuses on the heart's rate.

Question 3 provides you with a list of potential variables (things you can change). Each variable is a possible independent variable. Have the students select one variable they want to manipulate It will be your independent variable; all the rest must become constants in your experiment.

Question 4 helps you decide how to measure or describe changes in the noses' influence of taste. Select one of these ways to measure or describe the change in the noses' ability to influence to taste. The quantity or quality you choose is the way you will describe or measure your dependent variable

The Four Question Strategy was outlined only for one of the experiments given. You would follow the same procedure if you select the Tasty Visions experiment. The Four Question Strategy is also outlined in lesson 10.

Question 1: "How do noses act?" List the students' responses on chart paper.

Possible Answers:

- They run
- They smell
- They inhale air
- They help taste

Question 2: "What materials are readily available for conducting experiments on the noses' ability to influence taste?" List the students' responses on chart paper.

Possible answers:

- Nose
- Fingers to hold nose

Question 3: "How you could change each material listed to affect the influence your nose has on flavor?"

Possible answers:

- Taste without plugging nose
- Taste with plugging nose

Question 4: "How could you measure or describe the response of the change?"

Possible answers:

Identify the flavor of food

Have students select on independent variable from Question 3 (such as, activity) and one dependent variable from Question 4 (such as, measure the number of heart beats per minute (heart rate)) that they want to investigate. Remember that all of the other variables from Question 3 must remain the same in your experiment; they are your constants.

Share the Experimental Design Diagram (AppendixBB) with students. As a class complete the diagram using the information generated from the class discussion.

Conduct the experiment with the class. Below is a sample activity you may conduct with the students.

Tell the students you are going to investigate how your nose influences flavor.

The Nose Knows

The nose is responsible for part of the flavor of food. To demonstrate this complete the experiment.

Have students work in pairs. Blindfold one student and have that student hold their nose. The other student should give the blindfolded subject a jelly bean to eat.

Have the student try to distinguish the flavor of jelly bean. Repeat the procedure five times with five different flavor jelly beans.

The entire experiment should be repeated but this time the blindfolded subject should not hold their nose. Use the same five flavor jelly beans given in the same order (jelly bean 1 should be the same flavor with the use of the nose and without the use of the nose).

Have students reverse roles and repeat the experiment. This time they jelly beans should be given in a different order than the first time. However, the order should remain the same during the trial with the use of the nose and the trial without the use of the nose. It may also be helpful to use different flavors or a different type of candy so the student isn't aware of the "flavors" prior to the experiment.

Students should record results on the The Nose Knows (Appendix CC) data worksheet. During math students will graph and analyze the data collected answering the question: Does the Nose Know?

Tasty Visions

Does sight influence what you taste?

Prior to the lesson purchase four different flavored sodas (fruity ones such as lemon, grape, cherry, etc.). These sodas should also be different colors. Also get one unflavored, clear soda (such as, club soda or seltzer water). Add a few drops of food coloring to the unflavored, clear soda (orange works well). This will make it LOOK like orange soda, but of course, it will NOT have any taste.

Pour five drinks into different cups for taste testers (It is helpful to have the taste testers wait outside of the classroom while one taste tester is completing the experiment. You don't want the other taste testers to be influenced by what others say.)

Have one taste tester take a sip from each cup. The taste teller should tell what each drink tastes like.

Have another taste tester complete the same procedure as outlined above.

Record each taste testers' results on the Tasty Visions (Appendix DD) data worksheet.

How many people said your unflavored drink was "Orange"? During math students will graph and analyze the data collected answering the question:

Does what you see influence taste?

Ask the students how the nervous system interacts with the fitness goals of endurance, strength, flexibility, and balance.

Sample Responses:

- PNS and CNS work together to send messages back and forth to maintain proper muscle movements for balance
- Through regular running or sprinting the brain and nervous system work together in a complex system to quicken the contraction of the muscle

	<p>building speed and endurance.</p> <ul style="list-style-type: none"> • With regular stretching flexibility is increased leading to neurons that can fire faster to increase muscular endurance. <p>Record the students' responses on the Fitness Goals Chart (Appendix T).</p>
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Reading/Writing Focus

<p>Rationale</p> <p>Students will apply their knowledge on Determining importance in text with their knowledge on nonfiction conventions to create a nonfiction page on a topic of their choice.</p>	<p>Lesson Sequence</p> <p>Tell the students that today they are going to use their knowledge on nonfiction conventions and finding important ideas in text to create a nonfiction page on a topic of their choice.</p> <p>Students should select a topic that they would like to research. Have the students record five facts that he/she already knows about their topic on the Nonfiction Trade Book Research forms (Appendix EE).</p> <p>Next, have students record at least five questions they would like answered on the Nonfiction Trade Book Research forms (Appendix EE).</p> <p>While students are completing research they should write down a list of 5 new facts found on the new facts found form.</p> <p>After students have completed their research they should create a nonfiction page that uses the new information gathered as well as at least 5 nonfiction conventions.</p> <p>Have students share their final pages with the class.</p>
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Mathematics Focus

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Complete Statistics and data analysis from experiments conducted. Have students draw conclusions based on the results of the experiment.</p>
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Read Aloud

Smell (True Books) by Patricia J. Murphy
Touch (True Books) by Patricia J. Murphy
Hearing (True Books) by Patricia J. Murphy
Taste (True Books) by Patricia J. Murphy
Sight (True Books) by Patricia J. Murphy
Sniff, Sniff: A Book About Smell (Amazing Body) by Dana Meachen Rau
Look!: A Book About Sight (Amazing Body) by Dana Meachen Rau
Touch (Explore Your Senses) by Laurence P. Pringle
Taste (Explore Your Senses) by Laurence P. Pringle
Hearing (Explore Your Senses) by Laurence P. Pringle
Smell (Explore Your Senses) by Laurence P. Pringle

Comments

Lesson 8

The Muscular System



Morning Meeting

Rationale	Lesson Sequence
<p>Starting each day with a class morning meeting and classbuilding activities helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Similarity Groups was selected as an energizer to allow students to learn more about their classmates.</p>	<p>Classbuilding Activity/Similarity Groups</p> <p>Announce any topic on which students might group. For example, tell the students to think about their favorite dessert. Guide students' thinking by providing imagery about the topic. Think about the last time you had your favorite dessert. Where were you? How did it taste as you took your first bite?" Then, have students write down their favorite dessert.</p> <p>Have students stand up and move around the room looking for students who have the same or similar dessert written down.</p> <p>Have students to form pairs within their group to discuss their favorite dessert. For example, "Tell your partner what you like most about the dessert." Give each student a designated amount of time to share before switching.</p>

Investigation

Rationale	Lesson Sequence
<p>Students understand the concept of systems by investigating the muscular system.</p>	<p>Review the digestive and nervous system with the students.</p> <p>Explain that today we will learn about a new body system, the muscular system.</p> <p>Ask the students what they know about the muscular system. Complete a KWL Chart with the students. Ask the students what parts are in the muscular system and what the functions of each part are. Record the students' responses.</p> <p>Tell the students that muscles are responsible for your body's every move. If you leap, bend, or reach, this is a result of a muscle action. A muscle makes itself smaller when it contracts and larger when it relaxes. There are three types of muscles:</p> <ul style="list-style-type: none">• Skeletal muscles-- Skeletal muscles move and support the skeleton. They make up fifty percent of your body weight. There are 640 individually named skeletal muscles. A skeletal muscle links two bones across its connecting joint. When these muscles contract or shorten, your bone moves. Muscles are arranged in layers over the bones. Those nearest to the skin are called superficial muscles. Those closest to the inside of the body are called deep muscles. Skeletal muscles are voluntary muscles. These are muscles that we can consciously control.• Smooth muscles are found in the hollow parts of the body. This would be in places like the stomach, intestines, blood vessels and the bladder. Smooth muscles are arranged in layers with the fibers in each layer running in a different direction. This makes the muscle contract in all directions. A smooth muscle is an involuntary muscle. This means that you cannot

consciously control this muscle. These muscles are under the control of autonomic nervous system. This system controls many systems without us being aware of them.

- Cardiac muscles cells are striped, like skeletal muscle cells. Cardiac muscles contract automatically to squeeze the walls of the heart inward. The heart beats nonstop about 100,000 times each day. It can do this because of the cardiac muscles.

Show the students a diagram of the muscular system reviewing the various parts (Appendix S)

Read a book on the muscular system.

Ask the students what parts are in the digestive system and what the functions of each part are. Record the students' responses.

Ask the students if the muscular system is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

Ask the students how the muscular system interacts with the fitness goals of endurance, strength, flexibility, and balance.

Sample Responses

- Strength-building muscle gives us more strength through increased contraction and flexion
- Endurance- exercise strengthens heart which allows heart to work harder while requiring less energy.
- Flexibility-regular stretching increases muscle fibers length which leads to more efficient muscles
- Balance – Through balance exercises the muscular system works with the nervous system to develop neuromuscular pathways

<p>The idea for the push up activity was adapted from the following website: http://www.hhp.umd.edu/BeActiveKids/samples.htm</p> <p>During Math students will examine the data collected and draw conclusions. Therefore, it may be beneficial to complete the math lesson right after the investigation.</p>	<p>which increase balance.</p> <p>Record the students' responses on the Fitness Goals Chart (Appendix T)</p> <p>Tell the students that we can use exercises to increase our muscle strength. Explain that we are going to complete a series of exercises to increase our arm strength.</p> <p>Show the students the six different types of push-ups they will be completing (Appendix FF). Have a demonstrator perform each type. After each demonstration allow a few minutes for the students to practice and check for errors that will be critical to performing correctly.</p> <p>Have the students perform each push-up variety at your direction. Announce the first push-up to complete and have the students do as many push-ups as they can in the 30 second allotted time period. Have students record the number of push-ups completed in their Mighty Muscle data table (Appendix GG). Announce the second push-up to complete and instruct the students to do as many push-ups as they can in the 30 second allotted time period. Have students record the number of push-ups completed. Repeat the procedure for each type of push-up.</p> <p>Have students circle whether the difficulty level for each push-up type was hard, medium, or easy on the Might Muscle data table (Appendix GG).</p> <p>Tell the class that you will examine the data and draw conclusions during math.</p>
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Reading/Writing Focus

<p>Rationale</p> <p>Students will apply their knowledge on determining importance in text with their knowledge on nonfiction conventions to</p>	<p>Lesson Sequence</p> <p>Explain to the students that they will create a two-page spread to include information on a body system studied. The spread will</p>
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create a nonfiction page on a topic of their choice.

include general information about the system, parts of the system, and the function of the system.

The spread should contain text about the body system, five interesting facts about the body system, illustrations that support the text, as well as five nonfiction conventions. Share with students the Two Page Spread Rubric (Appendix HH) and the Two-Page Spread Checklist (Appendix II)

Allow students time to research, plan, and design their two-page spread. This activity may take several days to complete.

Have students work on completing their two-page spread.

Mathematics Focus

Rationale	Lesson Sequence
	<p>Have students complete a bar graph using the Mighty Muscle data. Analyze the data and draw conclusions. You can use some of the following questions to lead a discussion on the results:</p> <ul style="list-style-type: none">• Could you do more of the easy push-ups or the difficult push-ups?• Is there a relationship between the number of push-ups you could perform and the difficulty level?• Why were the difficult push-ups hard to perform?• How could you increase your muscular strength so you could become stronger? <p>Tell the students that we have to have enough muscular strength to push against the ground lift our body away from the ground, or hold our body up off the ground to perform these push-ups. Explain that we can increase our muscular strength by increasing the difficulty of an exercise. We need to do exercises that make your muscles work hard to help them become stronger. By doing push-ups that are hard for you, your muscles will change and become stronger.</p> <p>Ask the students if their fitness goal was to increase endurance what muscle would they want to work on strengthening. If their fitness goal was to increase flexibility what muscle would they want to work on strengthening. If their fitness goal was to increase strength what muscle would they want to focus on strengthening?</p>

Nonfiction Book Selections

How Our Muscles Work (Invisible World) by Victoria J. Avila and Antonio Munoz
Muscles (Your Body and Health) by Jen Green
The Muscular System (Early Bird Body Systems) by Rebecca L. Johnson
The Muscular System (Human Body) by Kristin Petrie
Usborne: Understanding Your Muscles and Bones by Rebecca Treays
Scholastic Time-to-Discover Reader: Your Muscles By Melvin & Gilda Berger

Comments

Lesson 9

The Respiratory System



Morning Meeting

Rationale	Lesson Sequence
<p>Students continue to develop a classroom community by meeting as a group and completing classbuilding activities.</p>	<p>Classbuilding Activity/Find-Someone Who</p> <p>With the Find-Someone-Who (Appendix F) worksheet in hand, students mingle through the room until they find a partner.</p> <p>When they find a partner they can ask each other questions from the worksheet until they find a question their partner knows the answer to.</p> <p>When your partner tells you the answer write it in the box in your own words on the Find Someone Who form and then have your partner sign your form.</p> <p>Reverse Roles.</p> <p>Circulate around the room to find another partner.</p>

Investigation

Rationale	Lesson Sequence
<p>Students understand the concept of systems by investigating the respiratory system.</p>	<p>Review the digestive, nervous system, and muscular system with the students.</p> <p>Explain that today we will learn about a new body system, the respiratory system. Ask students what they know about the respiratory system. Complete a KWL chart with the students on the respiratory system.</p>

Tell the students that the respiratory system is made of body parts that are in charge of your breathing. The nose allows you to inhale air and then moistens and heats the air. The windpipe (trachea) joins the upper respiratory tract to the lungs. The bronchial tree's job is to spread the air from the trachea over a very wide area in the lungs as quickly as possible. The lungs provide the breath of life. They fill our chest from the neck to the ribs. The lungs are the pickup place for oxygen and the drop off place for carbon dioxide. The lungs are always working, breathing in oxygen and breathing out carbon dioxide.

Show the students a diagram of the respiratory system reviewing the various parts.

Read a book on the respiratory system.

Ask the students if the respiratory system is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

Ask the students what parts are in the respiratory system and what the functions of each part are.

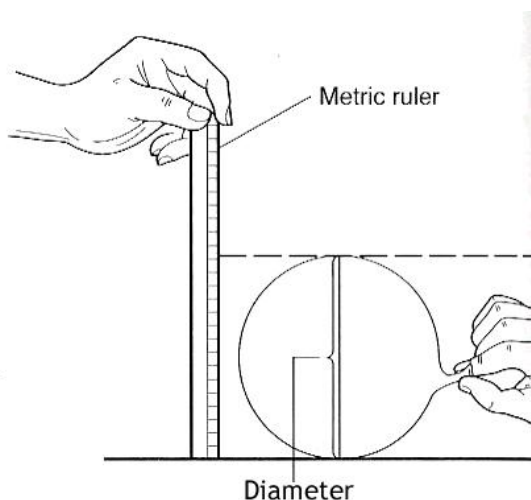
Ask the students how the respiratory system interacts with the fitness goals of endurance, strength, flexibility, and balance.

Sample Responses:

- Endurance-regular exercising (running) helps lungs stretch to have more capacity to be more efficient with relationship to the heart which leads to increase endurance
- Strength – The body depends on oxygen to function, without good oxygen intake and exchange it would be difficult for the body to build muscle.

Measuring your lung capacity can help you determine how much endurance you have

The picture below illustrates how to measure the balloon's diameter.



<http://www.biologycorner.com/worksheets/lungcapacity.html>

to go about your daily routines. We are going to complete an activity that measures our lung capacity.

Tell the students that the amount of air that you move in and out of your lungs while breathing normally is called Tidal Volume. The maximum amount of air you can move in and out of our lungs is called the Vital Capacity.

Distribute a balloon to each student. Have them stretch the balloon several times.

Instruct students to inhale normally and then exhale normally into the balloon. Make sure they do not force their breathing. Have students pinch the end of the balloon and measure its diameter. Have students complete this three times and then calculate the mean of the three numbers. Record the result on the Measuring Lung Capacity Data Chart (Appendix JJ).

Have students complete the procedure outlined above only this time inhale as much air as you can and exhale forcefully. Have students complete this three times and then calculate the mean of the three numbers. Record the result on Measuring Lung Capacity Data Chart (Appendix JJ).

Have students convert the diameters to a volume using lung capacity volume graph (Appendix KK) provided and record results on the Measuring Lung Capacity Data Chart (Appendix JJ).

Lead a discussion on the results of the data using the following questions:

- Why is it important to measure tidal volume and vital capacity three times and then get a mean?
- Compare your data to other members of the class. How can you account for differences?
- How might an athlete's vital capacity compare to a non-athlete?
- How could you increase a person's vital capacity?

	<ul style="list-style-type: none"> • How might vital capacity be important to a musician?
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Reading/Writing Focus

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Students should continue to work on their two-page Body System spread.</p>
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Mathematics Focus

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Prior to completing the investigation you may want to review diameter with students.</p>
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Read Aloud

<p>The Respiratory System (A True Book) by Darlene R. Stille The Respiratory System by Nuria Bosch Roca, Marta Serrano, and Nuria Roca Respiratory System (Reading Essentials in Science) by Susan Glass</p>
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Comments

Empty box for comments



Lesson 10

The Cardiovascular System



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Mix-Freeze-Group was selected as an energizer to promote a positive classroom environment. There are several Mix-Freeze-Group worksheets available in the appendix. You may select whichever one meets your classroom needs or you may create an original.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/Mix-Freeze-Group</p> <p>Announce to the students to push in their chairs and stand. Tell everyone to start to mix through the classroom by making right turns, left turns, and about faces. Tell them to spread out around the whole classroom.</p> <p>Have students keep moving until you call “Freeze.” Then, students should freeze exactly where they are located.</p> <p>Using the Mix-Freeze-Group worksheet What System Am I? (Appendix KK) students will determine the size of the group to form. Students will then rush to hold hands forming groups.</p>
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Investigation

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Review the digestive, nervous system, muscular system, and respiratory system with the students.</p> <p>Explain that today we will learn about a new body system, the cardiovascular system. Ask students what they know about the cardiovascular system. Complete a KWL chart with the students on the cardiovascular system.</p> <p>Tell the students that the cardiovascular</p>
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The Four Question Strategy utilizes the following questions:

- How do hearts act?
- What materials are readily available for conducting experiments on heart beats?
- How can you change the materials to affect the action?
- How can you measure or describe the response to the change?

After you have brainstormed as many actions as possible choose one action upon which you will focus. This lesson focuses on the heart's rate.

system is composed of the heart, arteries, veins and blood. The heart is a muscle that never stops. It pumps the blood through your body which carries oxygen and nutrients that you need. The heart is unique in that it can adapt its rhythm to ensure your muscles get the amount of oxygen they need. The slowest pulse for a human is around 30 beats per minute, and the highest is around 230 beats per minute.

The blood consists of four elements: red blood cells, which transport oxygen to your body and bring back carbon dioxide; white blood cells, which are used for killing germs and to pick up any dead blood cells; platelets which repair wounds by forming blood clot; and plasma, that is $\frac{3}{4}$ water and transports waste products.

The cardiovascular system (the name for the heart and all the blood vessels) consists of veins that bring blood to the heart, arteries that transport the blood to your muscles, and capillaries that distribute the blood to your cells.

Show the students a diagram of the cardiovascular system reviewing the various parts.

Read a book on the cardiovascular system.

Ask the students if the cardiovascular system is an example of a system. Have the students identify the elements, boundaries, inputs, outputs, and interactions.

Ask the students what parts are in the cardiovascular system and what the functions of each part are.

Ask the students how the cardiovascular system interacts with the fitness goals of endurance, strength, flexibility, and balance.

- Endurance- strengthening heart and maintaining a good vascular system

Question 3 provides you with a list of potential variables (things you can change). Each variable is a possible independent variable. Have the students select one variable they want to manipulate (say, the type of exercise). It will be your independent variable; all the rest must become constants in your experiment.

Question 4 helps you decide how to measure or describe changes in the heart rates. Select one of these ways to measure or describe the change in the plants ability and speed to grow. The quantity or quality you choose is the way you will describe or measure your dependent variable

Endurance

- With regular exercise the volume of blood pumped with each heart beat increases and heart rate becomes slower-the heart becomes more efficient.

Explain to students that they will be designing an original experiment on the heart. Lead students through the Four question Strategy (Appendix AA) to design the experiments.

Question 1: “How do hearts act?” List the students’ responses on chart paper.

Possible Answers:

- They beat
- They go faster
- They go slower
- They pump blood

Question 2: “What materials are readily available for conducting experiments on a Heart’s beat?” List the students’ responses on chart paper.

Possible answers:

- Activity/Exercise
- Breathing
- Caffeine
- Food

Question 3: “How you could change each material listed to affect the rate at which a heart beats?”

Possible answers:

Activity	Breathing	Caffeine	Food
type	rate	amount	type
intensity	depth	type	amount

Question 4: “How could you measure or describe the response of the change?”

Possible answers:

Count the heart beats per minute

Have students select on independent variable from Question 3 (such as, activity)

Have the students complete the activity for one minute. After the one-minute tell students to get ready to take their pulse. Time them for a 15-second interval. Allow the students at least one minute before beginning the next activity to ensure an accurate reading.

It would be beneficial to complete the math lesson right after you complete the experiment.

and one dependent variable from Question 4 (such as, measure the number of heart beats per minute (heart rate)) that they want to investigate. Remember that all of the other variables from Question 3 must remain the same in your experiment; they are your constants.

Share the Experimental Design Diagram (Appendix BB) with students. As a class complete the diagram using the information generated from the class discussion.

Conduct the experiment with the class. Below is a sample activity you may conduct with the students.

Tell the students you are going to investigate how exercise affects your heart rate.

Demonstration how to measure your heart rate, by using the pointer finger and middle fingers on your wrist to measure pulse.

Walk around the room to be sure all students can see the area on the wrist where the pulse can be taken.

Pulse should be taken by counting the beats for 15 seconds and multiply by four. Tell the students they should take their pulse two times to make sure it is accurate.

Distribute How Does Exercise affect Heart Rates data collection sheet to each student (Appendix LL).

Have students predict then measure their resting pulse rate. You may wish to do this twice to get an accurate reading.

Have students fill in their predicted pulse rates for each activity.

Explain to students that each partner will do an activity until told to stop, measure their pulse rate then write down their findings. The partners will then switch activities.

	<p>During the one minute wait time between activities, the student should be recording the effects the exercise has on the body.</p> <p>Circulate among the room, assessing students and providing help as needed.</p> <p>You will analyze and draw conclusions from the data during math.</p>
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Reading/Writing Focus

Rationale	Lesson Sequence
	Students should continue to work on their two-page Body System spread.

Mathematics Focus

Rationale	Lesson Sequence
It may be helpful to introduce students to a double bar graph so they could visually see and understand the data.	<p>Have students graph results from the experiment and draw conclusions. Lead a discussion on the results using the following questions:</p> <ul style="list-style-type: none"> • Does the heart beat slower or faster during exercise? • When does your heart beat the slowest? • When does you heart beat the fastest? • Why do you think your heart beats faster sometimes? • Why is it important to check your heart rate? • Does your heart work harder when you are resting or exercising? • Why is it important to exercise? • Why do you think our heart rate increased with the amount of activity?"

Read Aloud

Teacher's Choice

Comments

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Lesson 11

Exploring Systems



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activities helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p> <p>Mix-N-Match was selected to allow student to interact will all classmates creating a positive classroom climate. There are several Mix-N-Match cards available in the appendix. Teachers may select</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/Mix-N-Match</p> <p>Have students mix about the classroom switching cards (Appendix MM) with classmates as they pass them by.</p> <p>After students mix for awhile call, “Freeze.”</p> <p>Tell the students to, “Match,” finding a partner with a matching card. Students should walk around the room looking for another student with the matching card. When they find each other have them move to the outside of the room.</p> <p>When everyone has found their match tell the students to, “Mix,” again.</p>
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Investigation

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Review the following vocabulary with the students: carbohydrates, proteins, and fats. Emphasize what each one is essential for in regards to reaching fitness goals.</p> <p>Carbohydrates- are your body's main energy source. Carbohydrates’ fuel becomes fuel for your muscles and brain. Carbohydrates are sugars that your body converts to glucose to provide energy to your cells. Complex carbohydrates are</p>
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high-fiber foods, which improve your digestion. They help stabilize the blood sugar, keep your energy at an even level, and help you feel satisfied longer after your meal. Examples of complex carbohydrates include: apples, prunes, pears, oatmeal, zucchini, broccoli, pinto beans, kidney beans, lettuce, yogurt, brown rice, carrots, and tomatoes. Simple carbohydrates are more refined, are usually found in foods with fewer nutrients, and tend to be less satisfying and more fattening. Examples of simple carbohydrates include: fruit juice, soda, cake, candy, pasta made with white flour, bread made with white flour, and baked goods made with white flour.

Proteins- Protein foods are not a high source of energy; however protein is essential in the right amount for proper functioning of our bodies. Protein in food contributes essential amino acids to your diet. Amino acids are used by cells to build new proteins and repair the muscles, repair the bone, skin, organs and blood. Without protein, cuts and abrasions will not heal quickly, muscles will not grow and the blood doesn't clot correctly. Examples of proteins include: Meat, poultry and fish, Eggs, Dairy products, Seeds and nuts, Beans and lentils, Soy products, Grains, especially wheat and less so rice, barley and corn.

Fats: Fats help your body absorb many essential vitamins, maintain the structure and function of cell membranes, and preserve the integrity of your immune system. But fat is a very concentrated energy source, providing twice as many calories per gram as carbohydrates and protein. And too much of certain types of fat — such as saturated fat and trans fat — can increase your blood cholesterol levels and your risk of coronary artery disease.

As a class add proteins, carbohydrates, and fats to the Food Group Char (Appendix Q). This chart will serve as an aid when students develop their menus for their clients

	<p>Ask the students how eating proteins, fats, or a carbohydrate interacts with reaching fitness goals.</p>
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Sample Responses:

- Protein helps to build muscles
- Carbohydrates provides energy

Reading/Writing Focus

Rationale	Lesson Sequence
	<p>Ask students how knowing about body systems could help an athlete in training or a person who wants to tone muscles or stay healthy?</p> <p>Tell students that they will use their knowledge of body systems to develop an exercise and nutrition plan to help a client reach his/her goals.</p> <p>Ask students if they know what a nutritionist does. Explain that a nutritionist creates an exercise and nutrition program that helps a person achieve his/her goals. Nutritionists use their knowledge about body systems and how they work to design individual plans and help their clients put them to use. People may hire a nutritionist for help in losing weight, becoming fit, getting stronger, staying healthy, increasing endurance, or improving athletic performance.</p> <p>Your job as a nutritionist is to develop and present an exercise and nutrition plan that helps your client achieve his/her goals (Appendix VV). The training plan you design must a diet plan and exercise program for five days. Your exercise and diet plans must also relate to at least three facts about how the body systems work. You will present your plan to the class.</p> <p>Given the goals of the client, how can eating certain foods help? For example, if the client wants more energy, which foods can help? If the client wants to maintain a healthy heart, which foods are low in cholesterol and saturated fat?</p> <p>An exercise and nutrition planning guide is provided for the students (Appendix UU). Students should use this guide to plan the menus making sure their client is taking in the correct amount of food from each category depending on his/her age and</p>

<p>Students can use the following website to help them determine the recommended amount of food from each category depending on their client's gender, age, and physical activity level.</p> <p>http://www.mypyramid.gov/mypyramid/index.aspx</p>	<p>physical activity level. Students should also use the guide to determine the fitness plan remembering to include the frequency and length for each exercise. The planning guide serves as a rough draft. Students should decide how they will present the final menu and exercise plan.</p>
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Mathematics Focus

<p>Students have learned to identify elements in systems of attributes. They will use their knowledge to expand the concept of to number systems.</p>	<p>Lesson Sequence</p> <p><i>Number Systems</i> Display hundreds chart for referral during the lesson. If we can identify systems of attributes, then how about number systems? How might numbers be parts of systems? How might numbers be organized into systems? Can looking at a hundreds chart help us identify systems of numbers?</p> <p>Provide small groups with laminated hundreds boards and hundreds boards that have been cut into puzzles. (Appendix TT) As groups problem solve to assemble their puzzles, ask probing questions. What system are you using to assemble the puzzle and why? What other systems could be used? What are you noticing about the hundreds board as you assemble</p>
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	<p>the puzzle?</p> <p>Debrief as a whole group. Was the puzzle easy or difficult? Why? What systems did you use to make it easier? What impact did thinking of systems have on solving the puzzle? So, now what can we say about numbers as systems?</p>
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Read Aloud

Teacher's Choice

Comments

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Lesson 12

Exploring Systems



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activities helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/Mix-N-Match</p> <p>Have students mix about the classroom switching cards use the Mix-N-Match (Appendix MM) with classmates as they pass them by.</p> <p>After students mix for awhile call, “Freeze.”</p> <p>Tell the students to, “Match,” finding a partner with a matching card. Students should walk around the room looking for another student with the matching card. When they find each other have them move to the outside of the room.</p> <p>When everyone has found their match tell the students to, “Mix,” again.</p>
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Investigation

<p>Rationale</p>	<p>Lesson Sequence</p> <p>The students should work on creating their exercise and nutrition plans for their clients.</p>
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Reading/Writing Focus

<p>Rationale</p> <p>Students use learned skills in reading for research culminating projects.</p>	<p>Lesson Sequence</p> <p>Students should be working on developing their menus and exercise programs for the client selected. Assist students in using the learned reading strategies to glean information from their resources.</p>
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Mathematics Focus

Students consider inputs and outputs and understand how they relate to systems in mathematics.

Lesson Sequence

The Magic Function Box
Adapted from *Curriculum and Evaluation Standards for School Mathematics: Second Grade Book*

Create a Magic Function Box (Appendix NN)

Introduce the magic function box to the class and show how it is used. Students have access to a hundreds chart to problem solve.

Debrief

Once students have had a chance to use the magic function box, ask how it is a system. What is the boundary? (box) What are the elements? (the rule) What about input and output? What is being put into the system? (the number a student inserts) What is the output? (the answer) Explain how this system works. How do the input, element (rule), and output interact?

Read Aloud

Teacher's Choice

Lesson 13

Exploring Systems



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activities helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/Find-Someone Who</p> <p>With) worksheets in hand (Appendix F), students mingle through the room until they find a partner.</p> <p>When they find a partner they can ask each other questions from the worksheet until they find a question their partner knows the answer to.</p> <p>When your partner tells you the answer write it in the box in your own words on the Find Someone Who form and then have your partner sign your form.</p> <p>Reverse Roles.</p> <p>Circulate around the room to find another partner.</p>
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Investigation

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Have students continue to research and complete their exercise and nutrition plans</p>
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Reading/Writing Focus

<p>Rationale</p> <p>Students use learned skills in reading for research for culminating project.</p>	<p>Lesson Sequence</p> <p>Students should be working on developing their menus and exercise programs for the client selected.</p>
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Mathematics Focus

Students learn to identify a rule as an element of a mathematics system.

Lesson Sequence

Review the Magic Function Box, focusing on the input and output of the system.

With the Magic Function Box, students were given the rule and had to figure out the output. Today, students will problem solve to find out the rule when they are given the input and output numbers.

Give students the first three numbers of a pattern. For example:

- 1, 3, 5
- 7, 17, 27
- 2, 7, 12
- 99, 96, 93
- 85, 75, 65

Have students shade numbers on their hundreds charts to help identify the rules of the patterns. Have students use the rule to continue the pattern, showing the next three numbers

Students may begin to verbalize the rules with informal expressions, such as “hopping forward four spaces.” As the lesson progresses, model a more formal expression “plus four” and begin writing the rules as symbols “+4”.

Fiction Read Aloud

Teacher's Choice

Comments



Lesson 14

Sharing Learned Information



Morning Meeting

<p>Rationale</p> <p>Starting each day with a class morning meeting and classbuilding activity helps continue the development of the classroom as a community of learners throughout the duration of summer school.</p>	<p>Lesson Sequence</p> <p>Classbuilding Activity/Find-Someone Who</p> <p>With the Find-Someone-Who (Appendix F) worksheet in hand, students mingle through the room until they find a partner.</p> <p>When they find a partner they can ask each other questions from the worksheet until they find a question their partner knows the answer to.</p> <p>When your partner tells you the answer write it in the box in your own words on the Find Someone Who form and then have your partner sign your form.</p> <p>Reverse Roles.</p> <p>Circulate around the room to find another partner.</p>
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Investigation

<p>Rationale</p>	<p>Lesson Sequence</p> <p>Distribute the Systems Post Assessment (Appendix RR).</p> <p>Have students continue to research and complete their exercise and nutrition plans</p>
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Reading Focus

Rationale	Lesson Sequence
<p>Students use learned skills in reading for research culminating projects.</p>	<p>Distribute the Reading Post-Assessment (Appendix SS).</p> <p>Students should be working on developing their menus and exercise programs for the client selected. Assist students in using the learned reading strategies to glean information from their resources.</p>

Mathematics Focus

Rationale	Lesson Sequence
<p>Students work at appropriate challenge levels to identify numbers in a system.</p>	<p>Distribute the math post-assessment (Appendix OO).</p> <p><i>Differentiated lesson</i></p> <p>Novice Level – There is one number that fits into six different number systems. Can you help me find it? On each numbered hundred chart (Appendix PP) color the numbers that are:</p> <ul style="list-style-type: none">• 2-digit numbers• odd• between 5 and 55• less than 34• numbers with odd digits only• numbers you hear when counting by fives (starting on 5) <p>What number did you color on every chart?</p> <p>Provide scaffolding to support students' needs. Some students may need to review the concept of <i>odd numbers</i>, while others may struggle with the idea of <i>between</i>. Identify students' needs beforehand using pre-assessment information so students can be given background information before starting to solve the problem.</p> <p>Apprentice Level – Use the same procedure with the following clues:</p> <ul style="list-style-type: none">• 2-digit numbers• numbers containing the digit 3• less than 60• odd• between 31 and 51• numbers with the sum of the digits equaling 8 <p>Expert Readiness Level – Review types of number systems that have been identified throughout the week. If you think systematically, you can identify the parts of a number system on a blank hundreds chart.</p>

	<p>On a hundreds chart, we know that if the number is in the 5th column, it will have a 5 in the one's place. If the number is in the second, fourth, or sixth row, we know it will be an even number.</p> <p>Distribute <i>What's My Rule</i>, (Appendix QQ) and discuss problem A. How can we identify the first number? (May compare with a completed hundreds chart; the second row contains numbers in the teens, while numbers in the third column have a 3 in the one's place)</p> <p>Students work together or independently to solve the problems.</p>
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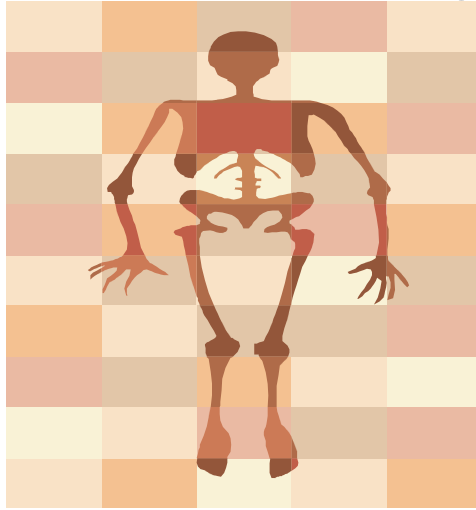
Read Aloud

Teacher's Choice

Comments

Lesson 15

Field Trip to Explore Systems



In the study of systems, the students will go on a field trip to George Washington's Mount Vernon to take pictures of and analyze the various systems (animal area, herb garden, flower garden, fruit garden, water system) that made that plantation successful.