Evelyn DeJesus
Unit Selection and Introduction
FLA 518
Summer 2003

1. Title: The Human Body

2. Grade Level: Grade 2

3. Target Group: Mainstream class with integrated ELL students


6. Informal Learning Goals:
   ✓ I want my students to know that there is more to the human body than meets the eye.
   ✓ I want my students to know that we have certain capacities as humans because of these unseen components.
   ✓ I want my students to know that the human body is a fascinating, complex "machine" that needs to be taken care of in order to "run" efficiently and last a long time.
# Unit Goals and Objectives

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<th>Language</th>
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<td><strong>Knowledge</strong></td>
<td>How to organize and synthesize content knowledge in writing</td>
<td>• Names of parts of the nervous system</td>
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<td>• How the brain and nerves make our bodies work</td>
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<td></td>
<td>• How muscles move</td>
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<td>• Names of specific bones and their functions</td>
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<td>• Why exercise and nutrition are important</td>
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<td>• What the heart and lungs do</td>
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<td><strong>Skills</strong></td>
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<td>Graphic organizer</td>
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<tr>
<td>✤ Utilize key terms and vocabulary in content context</td>
<td>✤ Dramatize the functioning of the nervous system</td>
<td>✤ Explain how the brain and nerves work</td>
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<tr>
<td>✤ Formulate sentences reflecting use of formulae, vocabulary and language structures</td>
<td>✤ Illustrate and write about bones and explain their functions.</td>
<td>✤ Identify, and locate bones and explain their functions</td>
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<td></td>
<td>✤ Discuss how muscles move.</td>
<td>✤ Describe how muscles move</td>
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<td>✤ Write about the function of muscles.</td>
<td>✤ Conclude the importance and effects of exercise and nutrition.</td>
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<td>✤ Design a menu</td>
<td>✤ Synthesize all learning into writing</td>
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<td>✤ Observe and record effects of exercise on the heart and lungs.</td>
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<td>✤ Collaboratively manipulate and compose an expository piece</td>
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<td><strong>Attitude/Awareness</strong></td>
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<td>• Aware of unseen components of the human body.</td>
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<td>• Appreciate human capacities due to these unseen components.</td>
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<td>• Appreciate how and why care is necessary to prolong capacities.</td>
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Lesson 1
## Language Function for Lesson 1
### The Nervous System

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<th>Situation</th>
<th>Formula</th>
<th>Structure</th>
<th>Vocabulary</th>
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<tbody>
<tr>
<td>Lesson 1</td>
<td>Explain</td>
<td>Function of brain and nerves</td>
<td>The ____ and ____ help us do things.</td>
<td>Regular Plural nouns (s)</td>
<td>Brain Nerves</td>
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<td></td>
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<td>Our brains ____ and ____ ____ .</td>
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<td>Nerves carry ____ to parts the body.</td>
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<td>Send Receive Messages</td>
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2
Lesson 1 The Nervous System

This is the first lesson of a unit on the human body. In relation to the goal of the unit, for students to know how systems inside the human body function and interact to facilitate human capacities, the purpose of this lesson is to introduce one of the systems involved in causing the motions/actions we are capable of in everyday life.

Objectives
All students will learn:
✓ The brain is the main organ in the nervous system.
✓ The brain and nerves are responsible for our movements and actions.
✓ The brain is located in our heads and nerves are dispersed throughout the body.

Most students will learn:
✓ The brain can send messages to allow us to interact with the world and receive messages about our experiences.

Some students will learn:
✓ The brain has three main parts: the cerebrum, the cerebellum and the brainstem.
✓ The cerebrum helps us with learning.
✓ The cerebellum helps us with balance and coordination.
✓ The brainstem helps us with involuntary actions such as breathing, sneezing, and heartbeat.

Procedure
1. On an overhead projector place a previously drawn outline of a human body and a detailed human body entitled The Human Body. Copies of the transparency drawings should be available for each student in step 3.
2. Tell students that today they are going to learn about how the body (point to overhead) moves and does things.
3. Teacher pantomimes an action such as smelling a flower. Students are asked to name parts of the body used to complete the action. Teacher labels those parts on the overhead and students do the same at their seats on their individual copies. Allow several students to pantomime an action for the class and have others name parts of the
body used. As students name body parts, teacher lists a description of the action and labels the appropriate body drawing on the overhead as students label their copies. Parts such as hands and legs should be labeled in the singular form and the plural with verbal and referential cues to the fact that we have two ____s. (expansion of OL)

4. Tell students that some body parts that help us do things cannot be seen. Refer to parts in detailed drawing on the overhead repeating the phrase "I can see ____." Point to parts in the outline drawing on the overhead and repeat the phrase "I can not see ____." 

5. Display a color poster of the human brain (side head view) entitled the brain with the three main parts labeled. Also display a plastic model of a human brain. Allow a brief period for comments/reactions/questions. Draw attention to the parts of the brain and mention what they do. Then tell students that the brain (have students repeat the word brain) is a part of the body that cannot be seen which helps us do things like (refer to list in step 3).

6. Display a large poster of the human body depicting the brain and the nerves throughout the body. Write the words nerves, messages, send and receive on the board. Tell students that the brain works together with nerves (have students repeat the word nerves) to send and receive messages to parts of the body.

7. Demonstration: Have students join hands and form a circle. Designate one student to be the "brain". Designate all the others as "nerves". Have the "brain" send a message by lightly squeezing the hand of the "nerve" on the right. Then each "nerve" passes on the message with a light squeeze of the hand to the "nerve" on the right. Have the "brain" raise a hand when the message is received from his or her left. Then have a "nerve" send a message in the opposite direction for the "brain" to receive. (Italicized words should be emphasized during the demonstration process). (OL)

8. Repeat the demonstration as if the message the "brain" is sending is to pick a flower and smell it (the last "nerve" would mime the action). Then have a "nerve" send a message to the "brain". Once received, the "brain" will verbalize the reaction.

9. Group students (groups of 3) to read pages 256-258 in their textbooks. Upon completion, they are to discuss what they've learned about the brain and nerves with their group. Note: Early ELL's would meet in a group with the teacher. As reading is being done, they should be trying to track words. Teacher will ask questions to check understanding allowing for differences in response levels. For example, a student can point to a body part, or answer yes/no. This small group time can also be used to develop vocabulary and/or focus on regular plural nouns in the text.
10. Once all groups have finished, ask groups to share what they learned with the class. As students respond, restate/paraphrase their responses using formulae (see language function chart). Also write contributions on chart paper. Then students will write 1-3 sentences about what they've learned in their science journals. Some students will be allowed to write as much as they feel necessary to convey their thinking (no limit). Beginning ELLs will be using formulae provided during the lesson and visibly available to use vocabulary in sentences. (See Language Chart for Lesson 1)

11. Have students work with a partner to create a life-size outline of their body on a piece of butcher paper. One lies flat while the other outlines. Then have students work independently to color and label the brain and nerves on their outlined figure. Some students should include the three different parts of the brain. (Save these for lesson 2). (OL)
Narrative

Various strategies to include ELL’s were implemented throughout the lesson. Two main strategies were continuously being used. When considering the varying levels of language proficiency in a mainstream classroom, it is necessary to make the input comprehensible in different ways. First, the lesson content was contextualized through the use of supplementary materials such as drawings, posters, models, and demonstrations. Oral language and key words/phrases were represented in writing and visually referred to in posters, etc. Second, teacher language was carefully structured to incorporate the use of supplementary materials in a way that reinforced the language and content objectives. Key words and phrases were also repeated and reinforced with the progression of the lesson and the accumulation of visual information available to draw from. The need to make input comprehensible for all learners is crucial to keeping students engaged in the lesson.

Other ways in which students were given the opportunity to engage were also provided in this lesson. During the initial stage of the lesson when real-life actions are being pantomimed and the teacher is gathering prior knowledge, some students are able to act something out but all students are engaged by either orally naming body parts and labeling an individual drawing which served as a listening guide. The demonstration was an opportunity to teach the concept in a more age appropriate modality as well as to develop vocabulary in the context of content and real-life actions. Opportunities to interact with the text and with peers were provided during the think-pair-share group reading and discussion. Students were given a more safe and comfortable environment in which to process new information and negotiate meaning. The text was made comprehensible as concepts and vocabulary had already been covered in the lesson introduction. The teacher facilitation of the ELL group was an opportunity for the teacher to check for understanding and/or develop key concepts/terms. The writing task was scaffolded in that much of the language was made visibly available, used in group discussions and guided-modeled during the sharing. Writing is another way to process new information as well.

A last consideration of the varying language levels in a classroom and the difficulty of some learners to grasp abstract concepts, the opportunity to create a physical manipulative (life-size drawing) was provided and would also serve as an evaluative tool for the teacher after each lesson.
Lesson 2
# Language Function for Lesson 2

## The Skeletal System

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<th>Unit</th>
<th>Function</th>
<th>Situation</th>
<th>Formula</th>
<th>Structure</th>
<th>Vocabulary</th>
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</thead>
<tbody>
<tr>
<td>Lesson 2</td>
<td>Define Explain</td>
<td>Skeleton and its functions</td>
<td>Bones ____ up your skeleton. Bones ____ your body its shape. Bones ____ other body parts. Bones ____ us move.</td>
<td>Sing./Pl. Noun/verb Agreement</td>
<td>Skeleton Bones</td>
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<tr>
<td></td>
<td>Name</td>
<td>Bones and their functions</td>
<td>The backbone ____ up the body. The skull ____ the brain. The ribs ____ the heart and lungs.</td>
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<td>Make</td>
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<td>Give</td>
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<td>Protect</td>
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<td>Protect</td>
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</table>
Lesson 2 The Skeletal System

This is the second lesson of a unit on the human body. In relation to the goal of the unit, for students to know how systems inside the human body function and interact to facilitate human capacities, the purpose of this lesson is to introduce another system involved in causing the motions/actions we are capable of in every day life.

Objectives

All students will learn:
✓ All of the bones of your body make up your skeleton.
✓ Bones give shape to your body.
✓ There are 206 bones in the adult human body.
✓ Some bones protect other body parts.
✓ Bones help us move our bodies.

Most students will learn:
✓ The backbone holds the body up.
✓ The skull protects the brain.
✓ The ribs protect the heart and lungs.

Some students will learn:
✓ The three leg bones are called the femur, tibia and fibula.
✓ The three arm bones are called the humerus, radius, and ulna.

Procedure

1. Tell students that today they will learn about their skeletons. Place a large magnetized, laminated flashcard with the word skeleton on the board have the children touch themselves to see if they can feel parts of the skeleton inside the body.
2. Wheel in a life-size model of a skeleton. Allow a brief period for comments/reactions/questions. Introduce him as Bob. Explain to the students that Bob is the same as they, but also different from them. Hold up two exact pictures of a skeleton and repeat same. Then hold up one picture of a skeleton and one of an adult male and repeat different. (Do this two or three times to convey the idea of same and different). Students should notice that they are both human but the skeleton does not have skin and
other exterior body parts. Point to these body parts and place a word card for each exterior body part to the side of the word skeleton. (i.e. skin, hair, eyes, ears, etc.). Tell students that these are outside the body. The skeleton is inside the body. Demonstrate inside and outside by placing an object inside and outside of a sock). Place these words on the board as well above the corresponding list of words already on the board.

3. Have students point to and name as many of the bones as they can on the skeleton as you stick labels to them on the model itself. Prompt for the following bones: skull, ribs, backbone. Ask for an estimate of how many bones there are in all. Tell them there are 206 of them and write 206 bones under the word skeleton. (expansion of OL).

4. Point to Bob's "helmet" and call it a skull. Label it. Ask what the skull does. Write: The skull protects the brain. Show protects by placing a real helmet on Bob's skull.

5. Identify the ribs and have children touch their own to see if they can touch them. Show that the heart and lungs are underneath the ribs and are protected by the ribs. Ask why they might need protection. Write: The ribs protect the heart and lungs.

6. Finally, unattach the spine from the model and let the other bones dangle loosely and even fall. Ask what the backbone does for our body. Write: The backbone holds up the body. Be explicit in steps 4-6 about the letter s at the end of the verb when there is only one noun; you could write the number 1 above the noun and no singular noun marker when the noun is plural (plurals addressed in previous lesson).

7. Students are given copies of page 260 of the text. They are to listen carefully as the teacher reads it aloud the first time for comprehension. Some students will need a tracking tool to stay on task. Then the teacher will read the page aloud again as students are instructed to listen carefully for verbs in the sentences about the skeleton. Beginning ELLs would have these noun/verb combinations highlighted on their copies. Intermediate ELLs would be given one with only the verbs highlighted.

8. Once these verbs and their accompanying nouns have been identified, the rule is reviewed and students use these parts to create the sentences in the formulae on the language function chart. The students are writing in their journals as the teacher is writing on the overhead or on chart paper.
9. Have students work with a partner to add the bones learned about to their life-size body outlines in black or gray crayon. Some students should include the arm and leg bones. All should include the skull, backbone and ribs. Save for Lesson 3. (expansion of OL)
Narrative
The modifications implemented in this lesson to make the content more comprehensible to ELLs and other disadvantaged learners consisted of an effort on the part of the teacher to repeat and demonstrate the meanings of words or concepts. For example, the words inside and outside might be very familiar to a native speaker or even a disadvantaged learner but to an ELL it is an important piece of the puzzle that may not be so obvious. It is important for assumptions not to be made about simple words such as these and take a brief moment to perform a simple demonstration to show the word in a way that conveys its meaning. Another example where I think this type of modification can be very effective is in Step 6 where the backbone is removed from the model of the skeleton and the bones fall apart. The objective was to explain the function of the backbone. Instead of telling them its function, students could observe the effects of not having a spine firsthand and use oral language to express their thoughts/ideas.
Another modification to make input more comprehensible was implemented by visually representing key words on word cards for students to have available for processing as the words were repeated throughout the lesson, and use to answer questions or share information/observations. The word cards are a valuable tool because they can later be manipulated and used in games and activities to develop vocabulary. The review of the exterior body parts from Lesson 1 in identifying differences between the skeleton and the man pictures was a great way to infuse vocabulary previously taught in a meaningful context. Beginning ELLs in particular need these multiple opportunities to hear vocabulary in varied contexts, over time, to become proficient users of the words. The most valuable opportunity to make input comprehensible in this lesson for me was in the teaching of the language structure. The text lends itself very easily to the structure targeted and because so much of the text had been pre-taught and read aloud once by the teacher, students could more readily focus on the isolation of the language structure. This portion of the lesson exemplifies the integration of language and content in a meaningful way. Students were engaged in interaction with the teacher, the text and with peers at various points in the lesson. Students interacted with the teacher in sharing background knowledge, in response to more open-ended questions, such as Why is it important for the lungs and heart to be protected? As well as during the brief period for reactions/comments/questions when the skeleton model was presented. Students, particularly at this age, are so curious and easily impressed with new things that to
allow them to express their thoughts about them not only diminishes that anxious energy but is an opportune time for the use of new language to surface. Interaction with the text was in my opinion the strength of this lesson. Listening and identifying verbs and nouns in the context of the science content was an opportunity to dissect both the structure and meaning of the text. Students need to become aware through activities like these that text is simply a speakable thought represented in writing. Hopefully then it can become less intimidating and digestible. In the final portion of the lesson, I give students the opportunity to work independently on their outlines but also engage in conversation with each other simultaneously. It is important to allow these less formal interactions with peers take place so that language and content input can be used and processed in a natural way.
Lesson 3
## Language Function for Lesson 3
### Muscles

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<th>Formulae</th>
<th>Structure</th>
<th>Vocabulary</th>
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<tbody>
<tr>
<td>Lesson 3</td>
<td>Describe</td>
<td>Muscles and their function</td>
<td>____ help move bones.</td>
<td>Adjectives (review)</td>
<td>Muscles</td>
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<td>Muscles are joined to ____</td>
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<td>Bones</td>
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<td></td>
<td>Muscles are ____ and can _______.</td>
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<td>Soft</td>
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<td></td>
<td>Muscles get ____ or _____.</td>
<td>Comparative Adjectives</td>
<td>Stretch</td>
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<td>(base word + er = more _____)</td>
<td>Shorter</td>
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<td>Longer</td>
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</table>
Lesson 3 Muscles

This is the third lesson of a unit on the human body. In relation to the goal of the unit, for students to know how systems inside the human body function and interact to facilitate human capacities, the purpose of this lesson is to introduce another system involved in causing the motions/actions we are capable of in everyday life.

Objectives
All students will learn:
✓ Bones and muscles work together to make the body move.
✓ Muscles are soft and can stretch.
✓ Muscles change shape as you use them.

Most students will learn:
✓ When muscles are shorter, they pull on the bone to which they are attached and make that bone move. If another muscle pulls the bone back, the first muscle becomes longer again.

Some students will learn:
✓ There are more than 600 muscles in the body.
✓ Muscles vary in size depending on the body parts they are responsible for moving.
✓ There are sixteen muscles in the face.

Procedure
1. Frame the main idea of the lesson by writing the following on the board: Bones and muscles make the body move. Tell students that today they will learn about the muscles in their body and how they make us move.
2. Tap prior knowledge about muscles using a K-W-L chart on the overhead. Focus on what students already know about muscles, then allow a brief period to share what they would like to know or wonder about muscles.
3. Have students touch their own bodies first feeling for bones and describing how they feel; then feeling the muscles and describing how they feel. The words generated are added to a pre-existing, student-generated list of adjectives in a different color. Use these adjectives to have students compare bones to muscles. Prompting questions may be: Which are harder/softer, bones or muscles? (Try to elicit words which reflect the elastic-like characteristic of muscles). Write the comparative adjective used on the board and next to it write the words more______. A few examples of these will be necessary. Explicitly teach the strategy of covering the -er suffix and checking for a real word. Use the word cover as an example of a word that does not have a real base word once the er at the end of the word is covered. Explain that some words just happen to end in er as well. *Teacher MUST speak clearly and with frequent pausing during this mini language lesson and use pointing, gesturing and real objects to show the meaning of the adjective and the concept being used in order for ELLs to have access to the input and later develop this vocabulary. Finally, refocus the lesson by reiterating that muscles are ...(using the adjectives students provided).

4. Ask students if they remember doing a certain exercise and feeling their muscles hurt the next day. Explain that they probably overworked their muscles. Ask students to think about a certain sport or game that they play and the muscles they use to do it. Write their responses on chart paper using the following sentence formula: When I play _____, I use my _____ muscles. (OL)

5. Refer to the large poster of the human body and show the muscles in the body. Explain that they are attached to the bones in the body and these work together to help us move.

6. Demonstrate the motion of the bones and muscles using two large rubberbands each with an end knotted around the metal ring of a medium-sized suction cup. Adhere the suction cup to the knee of a student volunteer. The lower band is placed around the bottom of the shoe and the upper band is fastened to a belt loop. Tell students that the rubberbands are muscles and the student’s leg is the bone. Have the student bend his knee back as the teacher describes (with gestures) the elongation of the top band as the bone is pulled back. Then have the student straighten the leg and again, describe (with gestures) the shortening of the rubberband as it moves with the bone going forward. Explicitly check for understanding periodically.

7. Another demo can be done with the bands as back muscles and the suction cup attached to the backbone. A student would bend over, stand straight, etc. to show the movement of bones and muscles.

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8. Pair students together and have them discuss which muscles in the arm (biceps-top/triceps-bottom) are getting shorter/longer as it is moved up and down bending at the elbow. Encourage students to use the words muscles, bones, shorter, and longer in their discussions. Beginning ELLs can use gesturing for long and short, and/or point to muscles in the arm. Students paired with ELLs should be more competent language users and capable of fostering cooperation from the ELL.

9. Assign the reading on text pages 262 and 263 for homework. In their science journals they will write the question: How do muscles help you move? and answer it for homework in at least three sentences. *See text in original lesson pages for simplification of text provided for ELLs. Underlined words are words ELLs are told to use in a) labeling an illustration in their science journal showing what they learned or b) 1-3 sentences using the formula: Muscles are __________. Words and formula are added to journal before it is taken home for the completion of the assignment.

10. Students will then add red shadings to the bones on their individual life-size outlines depicting arm, leg and back muscles. Save these for Lesson 4. (expansion of OL)
Narrative
In this lesson, the main idea was framed to provide a reference point for more visual learners as to what the lesson is about. Many times, especially at this age, students lose focus or ELLs get lost in the language and need redirection. A K-W-L format was used as a way to assess prior knowledge and provide interaction between students and teacher. Input was further made comprehensible during brief moments to experience the content through observations made about their own bodies and relate real life experiences about playing sports or exercising. When input is made personally relevant, it is also more engaging for students. The teacher used visual modifications such as the poster and the demonstration of how the muscles actually move. This was obviously done to make the input more comprehensible and make it a more developmentally appropriate learning experience. It is difficult to view a muscle at work so it made the concept more concrete. The poster depicted all of the systems discussed thus far and exemplifies the concept that the body’s systems interact to make our bodies work. During the paired discussion students were able to interact with each other and process knowledge using oral language. Beginning ELLs were strategically paired with more capable students and allowed to respond at an appropriate level. The final modification implemented was the simplification of the text assigned for homework as well as the written assignment given with the reading. The use of specific vocabulary and key terms were made clear and a choice of assignment was given for two reasons. First because I think it’s important for students to feel as if they have some control over their learning, especially if the learning experience is in a totally different language; affective issues are difficult to control but they can at least be addressed in any way possible. Second, because it would give me a chance to get to know more about the individual student’s learning style or preference and his or her inclination to challenge him or her self.
Lesson 4
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<th>Function</th>
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<th>Formulae</th>
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<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 4</td>
<td>Identify</td>
<td>Two ways to stay strong and healthy</td>
<td>E_______ and eating healthy _____ keep our_______ and _____ strong. We breathe in oxygen through our_____. The ______ is a muscle that pumps blood to our bodies. When we exercise the heart and lungs work ______. Exercise keeps our heart and lungs healthy too.</td>
<td>Sing./pl.Noun/Verb Agreement Review</td>
<td>Exercise</td>
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<td>Regular plural nouns Review</td>
<td>Food</td>
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<td>Bones</td>
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Lesson 4 Exercise and Nutrition

This is the fourth lesson of a unit on the human body. In relation to the goal of the unit, for students to recognize that the body needs care in order to function efficiently. The purpose of this lesson is to help students understand how to care for the body and the positive effects it has on various systems. The teaching of this lesson takes a different approach by placing students in a more active, self-teaching and learning role and with less formal teacher-directed instruction.

Objectives
All students will learn:
✓ Eating healthy food helps bones grow and stay strong.
✓ Exercise helps keep bones and muscles strong
✓ When you exercise, the heart and lungs works harder.

Most students will learn:
✓ The heart is a muscle.
✓ The heart pumps blood with food and oxygen that the body needs for energy.

Some students will learn:
✓ The systems in the body work interactively make us think and act.

Procedure
1. Tell students that today they are going to learn about how and why to keep their bodies (point) healthy and strong (gesture).
2. On a posted chart have the following statements written: 1) Eating healthy food helps bones grow and stay strong. 2) Exercise keeps bones and muscles strong. 3) When we exercise, our heart and lungs work harder. Read these aloud to students slowly and with frequent and effective pauses. Cover the last two.
3. Repeat statement number one and then divide students into groups of four with at least one ELL and one proficient native speaker. Have students fold a sheet of paper into fourths and label the sections: Breakfast, Lunch, Snack, and Dinner. Visual icons for these words should be displayed during the activity for ELLs to refer to.
Each student in the group is assigned a meal. They are to list the foods they would eat to comprise the meal the are assigned. ELLs may draw the food if necessary. Teacher should provide the word and label the drawing. Collect the menus.

4. Display a large color poster of the American Food Pyramid. Brainstorm foods not shown that would fit into each category. Bring attention to the model of the pyramid depicting smaller sections as those with foods we should have the least of. Samples of real foods that are healthy and unhealthy can be displayed and labeled healthy/not healthy. Discuss, in a conversational format, why we should have more of certain foods than others, and how they affect the body. Then give back the menus and have the students decide whether or not the foods listed are healthful. They should also analyze the menu as a whole to determine if they are getting more of the foods that they should and less of those they shouldn't. Allow time to modify their menus to make it a more healthful one. (expansion of OL)

5. Repeat statement number one and explain that eating too many “junk foods” and not enough healthful foods may be harmful to our body. (OL)

6. Now read statements two and three. Have students place their hands on their chests (model) and quietly (hands to lips) observe what they feel or hear (gesture). Students should mention a heartbeat and the motion of the chest moving up and down as they breathe.

7. On the poster of the human body have students volunteer to locate the heart and lungs. Explain to students that these organs are the ones mainly responsible for keeping us alive. Tell them that the heart is a special type of muscle (point to a muscle on poster). Its job is to pump blood full of nutrients from foods and oxygen from the air we breathe to the rest of the body. These parts should be labeled on the poster.

8. Reread statements two and three and define exercise as moving your body to help make it stronger. Ask and list what are some ways to exercise.

9. Pair students and have them observe their heart rate and breathing rate as they sit quiet and still. Their observations should be entered into their science journals. Next have pairs take turns doing twenty jumping jacks and again record their observations of heart rate and breathing rate. Finally, with journals and pencils in tote, take students outdoors. They are to run a distance (determined by the teacher that will clearly elevate both heart and breathing rates) and afterwards record their observations in their journals.
10. Upon returning to the classroom, reread statements numbers two and three again. Ask pairs of students to share their findings and discuss what happens to the heart and lungs when we exercise; why the change occurs; and why exercise is good for your health. Have student pairs use information gathered from the menu activity, the exercise activity, and all previous lessons (easily accessible through science journal entries) to collaborate in arriving at an answer to the following questions then write them independently: 1) Why is it important to eat healthy? 2) Why is it important to exercise? 3) Name two things we can do to stay healthy and strong. Name two things we should not do to stay healthy and strong. ELLs will have a modified version of this assignment. (See page 22 and 23 for samples of the assignment sheets).
Directions: Write the answer to each question on the lines that follow it. The answers have been started for you. Reread your work. Check to be sure that it looks right and sounds right.

1. Why is it important to eat healthy food?
It is important to eat healthy food because

2. Why is it important to exercise?
It is important to exercise because

3. Name two things we should do to stay strong and healthy. Then name two things we should NOT do to stay strong and healthy.
To stay healthy and strong we should______________________________
because______________________________
Two things we should NOT do to stay strong and healthy are

______________________________  ________________________________
Directions: Use the words from the word bank below to fill in the missing words.

<table>
<thead>
<tr>
<th>food</th>
<th>muscles</th>
<th>heart</th>
<th>lungs</th>
</tr>
</thead>
<tbody>
<tr>
<td>harder</td>
<td>Exercise</td>
<td>bones</td>
<td></td>
</tr>
</tbody>
</table>

E___________ and eating healthy ________ keeps our _________

and ____________________ strong. We breathe in oxygen through our

___________. The _________ is a muscle that pumps blood with food and

oxygen to our bodies. When we exercise the heart and lungs work _________.

Exercise keeps our heart and lungs healthy too.

*MODIFIED ASSIGNMENT
Narrative

Many of the modifications implemented in previous lessons such as pointing, gesturing, slow rate of speech with pauses, and repetition of key concepts were also included throughout this lesson. As previously stated all of these simple strategies make input more accessible to ELLs and other disadvantaged students.

The main ideas to be explored were written in statement form and framed. These main ideas were used as the framework for the activities involving group or pair work, allowing for interaction among students to take place as well. The assigning of a specific meal for each member of the menu group ensured that ELLs would not be marginalized in the small group setting. Visual icons for the meal words also made the task more easily understandable to ELLs. The opportunity to draw foods if not able to name them was another strategy to engage the ELL at his or her level of language development.

I thought it would be purposeful for students to arrive at the conclusions expressed in the main idea statements through a more deductive process this lesson, rather than teaching them overtly as in previous lessons.

Conversational instruction on the topic of foods was a valuable opportunity for learning to occur on a level where students were given equal talk time and express themselves in a more naturalistic way. This part of the lesson also lend itself to the integration of cultural foods and eating habits.

Content was also made comprehensible by relating it to each student’s own body and the opportunity to experience the lungs and heart at work firsthand.

Finally, a modification to the written answer assignment reinforced new and old vocabulary, concepts and language structures using simple language and more developmentally appropriate writing expectations.
Lesson 5
<table>
<thead>
<tr>
<th>Unit</th>
<th>Function</th>
<th>Situation</th>
<th>Formulae</th>
<th>Structure</th>
<th>Vocabulary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lesson 5</td>
<td>Formulate</td>
<td>Sentences about learned topics</td>
<td>See Formulae in Language Charts for Lessons 1-4</td>
<td>See Structures in Language Charts for Lessons 1-3 (Lesson 4 was a review of same structures)</td>
<td>See Vocabulary in Language Charts for Lessons 1-4</td>
</tr>
</tbody>
</table>
Lesson 5 Writing About Science

This is the fifth lesson of a unit on the human body. Its aim is to teach students how to organize information and compose a clear and fluent synthesis of the content knowledge reflecting acquisition of language structures and vocabulary addressed in the unit.

Objectives
All students will learn:
✓ Text is organized into paragraphs.
✓ A paragraph in writing denotes the beginning of a new topic/idea.
✓ The first word in a paragraph is indented.

Most students will learn:
✓ Ideas for writing can be organized graphically and used to help us write better.

Some students will learn:
✓ The first sentence in a paragraph tells the main idea.
✓ All other sentences in a paragraph provide details that support the main idea.

Procedure
1. Put a copy of the graphic organizer on the overhead. (see page 273 of OL) Explain the structure of the organizer as depicting the main idea, two categories studied and then specific topics learned about in each category. Tell students that graphic organizers help us organize our ideas/information to make us better writers.
2. Students are then put into groups and given the exact same organizer but with the words actually cut into separate pieces. Have students reorganize the organizer to look like the one on the overhead. Provide each group with blank sentence strips and markers.(expansion of OL)
3. Point to the word Brain and tell one thing you learned about it. Write your contribution on a sentence strip and place it under the word Brain. Ask students to continue in this manner with the other words under the headings Parts and Care. Each member of the group must contribute at least one sentence strip. They may use their science journals.
4. Once this is done, explain to students that with each new topic in writing, we indent
and begin a paragraph. Have them move the first topic card slightly to the left of the
sentence strips. Have students read the organizer and suggest that we need a complete
sentence to begin each paragraph instead of just one word. Model by thinking aloud what
might represent a good main idea sentence for the topic of the brain. Replace the word
brain with a different colored main idea sentence strip from the strips already used by
students. Have the students help construct a main idea sentence for Healthy Food.
Continue to do together until students seem comfortable and then allow them to construct
them for the other topics in their groups.
5. Students should read their compositions to eachother in their groups. Then ask
students to gather their strips, mix them up, and switch with another group. Now group
members need to work together to recompose the text in strips so that is organized
correctly, and in a way that makes sense. The sentence strips are finally glued onto
chart paper (one for each group) and posted in the hallway along with their now complete
life-size outlines of the human body.
Narrative
The writing curriculum in second grade focuses mainly on narrative writing. However, it is important for students to be exposed to expository text and become familiar with its structure and shape because it aids in the comprehension of the content. In this lesson the most obvious modification implemented was the visual representation and manipulation of the organization of an expository text. The students were engaged in the activity as contributing members of a small group and the actual manipulation of the parts of the text. Students were able to process content knowledge through interaction with each other as they formulated supporting detail sentences for each topic covered in the unit. The teacher modeled the formulation of main idea sentences providing supportive instruction by thinking aloud the process and criteria of a good main idea statement. Texts were not individually composed because writing and its organization is very difficult for children this age to grasp and achieve particularly if they are ELLs or disadvantaged learners; again this lesson’s aim was to provide exposure and scaffolded practice. This approach also addressed the varying levels of language proficiency in that students could contribute in various ways, at their own levels. Even ELLs were engaged through the use of previously used formulas, journal entries, and visual aids posted and available throughout the classroom from previous lessons. Finally, it was an opportunity to develop content vocabulary, apply language structures and engage with student generated text reflecting content knowledge.
Checklists
# Grammar Checklist

<table>
<thead>
<tr>
<th>Structure</th>
<th>Lesson</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regular plural nouns</td>
<td>1, 4, 5</td>
</tr>
<tr>
<td>Sing./Pl. Noun/Verb Agreement</td>
<td>2, 4, 5</td>
</tr>
<tr>
<td>Comparative Adjectives</td>
<td>3, 4, 5</td>
</tr>
</tbody>
</table>
# Functional Checklist

<table>
<thead>
<tr>
<th>Functions</th>
<th>Lessons</th>
</tr>
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<tbody>
<tr>
<td>Explain</td>
<td>1,2,3,4,5</td>
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<tr>
<td>Identify</td>
<td>1,2,3,4</td>
</tr>
<tr>
<td>Utilize</td>
<td>1,2,3,4,5</td>
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<tr>
<td>Locate</td>
<td>1,2,3,4</td>
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<tr>
<td>Dramatize</td>
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<tr>
<td>Create</td>
<td>1</td>
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<tr>
<td>Illustrate</td>
<td>1,2,3,4</td>
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<tr>
<td>Define</td>
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<tr>
<td>Describe</td>
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<td>Design</td>
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<td>Observe</td>
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<td>Record</td>
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<tr>
<td>Conclude</td>
<td>4</td>
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<tr>
<td>Formulate</td>
<td>1,2,3,4,5</td>
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<tr>
<td>organize</td>
<td>5</td>
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<tr>
<td>Compose</td>
<td>5</td>
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</table>
Write the PAGE NUMBERS and any other identifying features to identify those parts of your lessons that employ the following strategies.

<table>
<thead>
<tr>
<th>I. Contextualize Lesson</th>
<th>Lesson 1</th>
<th>Lesson 2</th>
<th>Lesson 3</th>
<th>Lesson 4</th>
<th>Lesson 5</th>
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<tbody>
<tr>
<td>I.1.a Visuals (Realia, Manipulatives, Gestures)</td>
<td>P.3,4</td>
<td>P.7,8</td>
<td>P.12</td>
<td>P.15,16</td>
<td>P.21</td>
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<tr>
<td>I.1.b Model (Instructions, Processes)</td>
<td>P.3,4</td>
<td>P.8</td>
<td>P.12</td>
<td>P.21</td>
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<tr>
<td>I. 2. Activate Background Knowledge</td>
<td>P.3</td>
<td>P.11</td>
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| II. Make Text Comprehensible | | | | | | |
|-------------------------------|----------|----------|----------|----------|----------|
| II.1. Graphic Organizers | | | | | | |
| II.2. Develop Vocabulary | P.4 | P.7,8 | P.11 | P.16 |
| II. 3. Simplify Written Text | | | P.12 | | P.21, 22 |

| III. Make Talk Comprehensible | | | | | | |
|-------------------------------|----------|----------|----------|----------|----------|
| III.1. Graphic Organizers; Listening Guides (checklists, etc.) | | | | P.21, 22 |
| III. 2. Frame Main Ideas | | | P.11 | P.15 | P.21 |
| III. 3. Pace Teacher’s speech | P.4 | P.7 | P.12 |

| IV. Engage: Opportunities for Output | | | | | | |
|-------------------------------------|----------|----------|----------|----------|----------|
| IV.1. Teacher Questioning and Response Strategies; Instructional Conversations | | | P.11 | P.16 |
| IV.2. Small Group Work (including Information gap activities) | P.4 | P.8 | P.12 | P.15,16 | P.21 |
| IV.3. Meaningful, real-life activities; Students as researchers | | | | | | |

| V. Engage at Appropriate Language Proficiency Levels | | | | | | |
|------------------------------------------------------|----------|----------|----------|----------|----------|
| V.1. Use questions appropriate for language levels | P.4 | | P.11 | | |
| V.2. Assign appropriate tasks for varying levels | P.4 | P.8 | P.12 | P.15 | P.21 |

| VI. Literacy/Academic Development | | | | | | |
|-----------------------------------|----------|----------|----------|----------|----------|
| VI. 1. Allow use of L1 for planning and conceptualizing | | | | | | |
| VI. 2. Lots of real oral and written language | P.4 | P.7,8 | P.12 | P.15 | P.22 |
Original Lessons
FOCUSING THE UNIT

As the boys shown in the photograph run, all the major body systems—nervous, skeletal, circulatory, respiratory, and excretory—are involved. The nervous system triggers contractions in skeletal muscles, which pull on the bones to which they are attached. The bones are thus moved into new positions. The increased work of the muscles requires more oxygen to be supplied by the respiratory and circulatory systems. Waste products from the increased metabolism of muscle cells must be removed by the excretory system.

Ask the students to describe what happens to their bodies during exercise. List their observations on the board. Then help them identify the different body parts of systems involved (sweating—skin; faster heartbeat—circulatory system; deep breathing—lungs; moving arms and legs—bones, muscles, and nervous system).
Choose from the following warm-up exercises.

Getting Started Call on a volunteer to read the Getting Started text aloud. Have students list ten actions they have taken today in class along with the body parts they used for each. List responses in chart form.

Warm-up Activity On the chalkboard, draw the outline of a human body. Challenge the students to identify as many different body parts as they can. As they name body parts write each on the correct location on the outline. Tell students that in this lesson they will learn more about how the many parts of a human body work together and keep a body healthy.

Think! Predict that a head injury could prevent the brain from sending and receiving messages.

SKILLS ACTIVITY OBJECTIVE Identify what is done and observed in an investigation.

FOCUSING THE LESSON Nervous system

Vocabulary Write brain on the chalkboard and pronounce it for students. Ask students to list body parts controlled by the brain. Record their responses on the chalkboard. Write the word nerves on the chalkboard and have students pronounce the word with you. Tell them that they will read about how the nerves help the brain control the body.

Choose from the following warm-up exercises.

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Warm-up Activity On the chalkboard, draw the outline of a human body. Challenge the students to identify as many different body parts as they can. As they name body parts write each on the correct location on the outline. Tell students that in this lesson they will learn more about how the many parts of a human body work together and keep a body healthy.

You cannot see all the parts of your body. Many parts are covered by skin, muscles, and bones. You can feel bones and muscles when you squeeze your arm or leg.

You can hear some body parts move. Sometimes you can hear your heart. Think about how your stomach makes noise. Listen as you tap your teeth.

Teacher Options

READING STRATEGY

Before reading the lesson, have students read the lesson question What do different body parts do? and picture captions. Ask for volunteers to predict answers to the lesson question. Ask the picture captions help them answer the lesson question. Instruct students to be aware of the lesson question as they read the lesson.

LIMITED ENGLISH PROFICIENCY

Have students work with a partner to create a life-size outline of their body on a piece of butcher paper. One student can lay their flat on the paper as the other outlines with a colored pencil. Then have students work independently to color and label the parts on their outlined figure. Display each figure along a wall or glue them to large pieces of cardboard and arrange them around the classroom.
Body parts work together. The girl’s arm, hand, and eyes work together as she throws the disk. Think about the actions you do. Your mouth, throat, and stomach work together when you eat and drink. What body parts work together when you read this book out loud?  

Answers will vary but may include eyes, brain, mouth, tongue, and lips.

Body parts used in eating and drinking

Body parts work together. The girl’s arm, hand, and eyes work together as she throws the disk. Think about the actions you do. Your mouth, throat, and stomach work together when you eat and drink. What body parts work together when you read this book out loud?  

Answers will vary but may include eyes, brain, mouth, tongue, and lips.

Body parts used in eating and drinking

Questions Students Ask: What body parts help me breathe? When you breathe, you bring air through your nose. This air travels to your lungs. The lungs are sacs that take in clean air and pass it on to other parts of the body. The movements of muscles between your ribs, along your chest, and under your chest move to let you both take in the air and breathe out carbon dioxide.

TEACHING/GUIDED LEARNING

- Have students read the first paragraph. Then have them feel the bones that make up the wrist. Tell them to use their fingers to feel the bone (ulna) that is on the same side as the little finger, and follow the bone up to their elbow. Then gently squeeze the outside part of the arm (biceps) muscle which is located above the elbow. Ask students to compare the difference in the way the bones and muscles feel.
- Point out that each group of bones, muscles, and tendons carries out certain activities. The bones and tendons in our fingers help us to do such things as write and draw. The bones and muscles in our arms help us to do such things as throw a ball and reach for objects.
- Explain that there are no muscles in the fingers. The muscles in the wrist are attached to tendons (connective tissues) that run up the bottom and top of the fingers. It is these tendons, along with bones, that help people write and draw.
- Read the second paragraph on page 256 with students. Ask: When are you able to feel your own heartbeat? (Answers may include when involved in activity, or when frightened, or when sitting quietly.) Invite the school nurse to bring a stethoscope to class and demonstrate its use.
- Point out that our stomachs make noises as part of the natural process of digesting our food. Sometimes the noises are loud enough so that we hear them. Ask: When might you hear your stomach make sounds? (When resting, when hungry, when the stomach is upset)
- Direct students’ attention to the picture of the Frisbee player. Ask: Which of the girl’s body parts are working together? (Her arm, legs, brain, muscles, bones)
- Have a volunteer read the paragraph on page 257 aloud. Then tell the class to watch the reader carefully, looking for the body parts being used, as the reader reads the question aloud.

Check for Understanding

Ask: What body parts do you use to kick a ball? (Answers may include legs, feet, eyes, and arms.)

- Assign Connections 3 (AIMS) with this lesson.
- Assign Connections 13 (Project Learning Tree) with this lesson.
Draw two squares, two triangles, and two circles on the chalkboard in a random arrangement. Tell students to look at the shapes. After one minute, erase the chalkboard. Have students try to draw the shapes in the way they were arranged on the chalkboard.

CHECK FOR UNDERSTANDING
Ask: What body part helps us recognize shapes? (Brain) What body part helps us remember the way in which shapes are arranged? (Brain) Explain that it is our brain that helps us learn everything we know.

Read and discuss the Lesson Review with students. The answers follow.

LESSON REVIEW (Practice)
1. You use your mouth, throat, and stomach to drink. You use your shoulder, arm, hand, and eyes to throw a ball. OBJECTIVE A

2. Your brain sends messages to, and receives messages from, parts of your body. Nerves carry the messages to and from your brain. OBJECTIVE B

Think! An injury to the head could hurt the brain. If the brain is hurt, it may not be able to send messages and control the parts of the body.

CLOSING THE LESSON

LESSON SUMMARY
Ask: What do different body parts do? (Bones and muscles help people to move in many different ways; the heart pumps blood through the body; the brain sends messages to, and gets messages from, the body.)

Point out that in the next lesson students will learn more about the bones in the body.

LESSON CONNECTION
Life Science to Earth Science Point out to students that some people complain of aching bones and muscles when the weather turns cold and damp. Explain that in cold weather muscles can tighten, causing these people to feel pain. Point out that athletes, such as football players, wear warm clothing to prevent their muscles from tightening in cold weather.

Teacher Options
RETEACHING A Different Modality
(Kinesthetic) Have students join hands and form a circle. Designate one student to be the "brain." Designate all the other students as "nerves." Have the "brain" send a message lightly squeezing the hand of the "nerve" on the right. Then each "nerve" in turn should pass along the message by squeezing the hand of the next person on the right. Have the "brain" raise a hand after receiving the message from the person on his or her left.
CONTENT OBJECTIVES
A. Explain that bones give shape to the body and support and protect other body parts.
B. Identify ways to keep bones healthy.
C. Describe how muscles move bones and how exercise helps make bones and muscles strong.

Think! Identify the skull as a body part that protects the brain. Ribs protect heart and lungs.

ACTIVITY OBJECTIVES
Construct a model of a human backbone.
Construct a three-dimensional model.

FOCUSING THE LESSON

Vocabulary Write skeleton, bones, muscles, and exercise on the chalkboard. Ask students to suggest how the words are related to each other. Ask for volunteers to find each word in context in the lesson and read the sentence for the class.

Getting Started Explain that the places where bones come together are called joints. There is a cushion between movable joints called cartilage. This cushion of cartilage helps people move without pain. Have students trace their hands on paper and mark some of their joints in their hand on their outlines. Suggest that they find their joints by moving their hands in many different ways.

Warm-up Activity Have students try to be stiff-fingered for a short period of time. To immobilize their hands, place a folded magazine over students’ fingers and hold it in place with a thick rubber band. Ask students to describe the difficulties they experience by not being able to bend their finger joints.

DEVELOPING THE LESSON

TEACHING/GUIDED LEARNING
Read the text with students. Refer to the drawings of the human skeleton. Point out that the brain is protected by a helmet of bone—the skull. Ask: Why do football and baseball players wear helmets? (To protect their skulls)

Teacher Options

READING STRATEGY
Before reading the lesson, explain that the main idea sentence is usually at the beginning or end of a paragraph. Choose a paragraph from the lesson and help students locate the main idea sentence. Ask students to be aware of the main idea sentences as they read the paragraphs in the lesson.

QUESTIONS STUDENTS ASK
How many bones are there in my body? A grown-up has 206 named bones. Oddly enough, children have as many bones in their bodies. Children have a number of tiny bones that eventually grow together (fuse).
Healthy bones grow. That is why you get taller. Healthy bones are strong bones. Eating healthful foods helps bones stay strong. Be careful when you play so you can keep bones from being injured.

Have students point to and identify as many of the bones as they can on the skeleton.

Read the text with students. Have students suggest what is meant by "healthful foods." (Foods rich in vitamins and minerals) Then lead a discussion about how to keep from being injured when playing outdoors. (Wear protective clothing, helmets, and equipment when playing sports.)

Have students fold a sheet of paper into four sections and label the sections: Breakfast, Lunch, Snack, and Dinner. Have students draw in each section appropriate foods that will provide them with materials necessary for the development of strong, healthy bones. Have students exchange papers and help them evaluate one another's papers to decide whether or not the foods drawn are healthful. Explain that eating too many "junk foods" and not enough healthful foods may be harmful to proper growth and development.

CHECK FOR UNDERSTANDING
Ask: What does the skeleton do? (It holds up the body and helps it move; it protects the parts inside the body.) Why is it important to follow safety rules while playing? (To prevent accidents that could harm bones or other parts of the body)


Use Overhead Transparency 5 with this lesson.

TED ENGLISH PROFICIENCY
Students sit up straight in their chairs, close their eyes and about the muscles and bones that help them sit up. Ask students to stand up and pay attention to the muscles they use to do it. Ask students if they remember doing a certain exercise and feeling their muscles hurt the day. Explain that they probably overworked their muscles. Ask students to think about a certain sport or game that they play and the muscles they use to do it.

VISION
At a butcher or supermarket, obtain beef bones cut in half. (Chicken or beef bones may also be used.) Have students examine the bones. Have them identify the hard outer skin and the marrow within.

Use the following videodisc chapter to help students develop their understanding of bones.

SCIENCE HORIZONS Videodisc Concept Library, Volume B
Side A, Chapter 07
"Bones"

Use the following videodisc chapter to help students develop their understanding of the brain.

SCIENCE HORIZONS Videodisc Concept Library, Volume B
Side A, Chapter 08
"Brain"
After students have read the text, give each one an empty cardboard tube to hold as if it were a baseball bat. Have students study their own fingers, hands, and arms, and note the many muscles that they use as they grip and swing the "bat."

Ask: How do muscles help people move? (Muscles can become shorter or longer. When they are shorter, they pull on the bone to which they are attached and make that bone move. If another muscle pulls the bone back, the first muscle becomes longer again.)

Bones do not move by themselves. **Muscles** are body parts that help move bones. **Muscles** are joined to bones. Unlike bones, muscles are not hard. **Muscles** change shape as you use them. **Muscles** can get shorter or longer.

Look what happens when you kick a ball. When one muscle gets shorter, it pulls on the bone it is joined to. That makes the bone move one way.

Teacher Options

**MATHEMATICS-SCIENCE CONNECTION**

Have students do the following activity to see how quickly their muscles become tired. Have students place one of their elbows on their desk with the palm facing them. Have them count the number of times they can make a fist in thirty seconds. Make sure they open and close their hands completely. Have students do this three times, each time recording the count. Then have them compare their results. (They should find that the first count is the greatest and the last count is the least.) Point out that if muscles become tired too quickly, it may be because they are not being exercised enough.
Another muscle pulls the bone the other way. Find this muscle in the drawing above. What happens to the bone when this muscle gets shorter?

Muscles can be large or small. Leg muscles are large. They help you run or walk. Face muscles are small. They let you smile or frown. They let you open and close your eyes. There are more than 600 muscles in your body.

The pulling makes us move.

Muscles can be large or small. Leg muscles are large. Face muscles are small.

Point out that there are sixteen muscles in the face and that with these muscles over one hundred facial expressions can be made. Have students smile, frown, and make funny faces to move their facial muscles.

CHECK FOR UNDERSTANDING

Ask: Which body parts cause movement? (Muscles) To which body parts are muscles attached? (Bones)

Have students point to which muscle shortens when the arm is bent at the elbow (biceps) and which muscle relaxes as this is done (triceps).

Add red shadings for muscles to bones on life size cut outs.

THEMATICS-SCIENCE CONNECTION

Project Cut out the two short sides of a low, long cardboard box. Tape a meterstick along the length of the box. Have students take turns sitting on the floor with the box ring their feet and lower legs. Have students reach toward toes and note the farthest distance on the meterstick that can reach. Record each student’s distance. Over several days, have students do activities that require them to bend and stretch. Then have students use the box to measure their reach. (The exercise should have helped them to increase their reach.)

Use the following videodisc chapter to help students develop their understanding of muscles.

SCIENCE HORIZONS Videodisc Concept Library, Volume B

Muscles
Side A, Chapter 20

Use the following MIST chapter to help students raise interesting questions about how bones and muscles of the human body affect movement.

MIST
Forces, Machines and Structures

Muscles
Side A, Chapter 20

The Human Machine
Side 2, Chapter 27
Read the text with students and have them discuss the physical exercises they enjoy.

Entitle a bulletin board display “We Exercise to Keep Healthy.” Have students either make drawings of the way they exercise or bring in photos of themselves exercising to affix to the board.

CHECK FOR UNDERSTANDING
Ask: Why should everyone exercise? (Exercise helps make bones and muscles strong.)

Read and discuss the Lesson Review with students. The answers follow.

LESSON REVIEW (Practice)
1. Bones give shape to your body. They support and protect other body parts. **OBJECTIVE A**
2. Eating the right foods and being careful when you play help keep your bones safe and healthy. Exercise also helps you build strong bones. **OBJECTIVE B**
3. Muscles become longer or shorter. When one becomes shorter, it pulls on the bone it is attached to and makes that bone move. **OBJECTIVE C**

Think! The brain and nerves inside the head protect

3 CLOSING THE LESSON

LESSON SUMMARY
Ask: How does your body move? (The body moves in many different ways. Bones, joints, and muscles work together to make the body move.) Point out that in the next lesson students will learn more about what exercise does for the body.

LESSON CONNECTION
**Life Science to Earth Science** Point out to students that climatic and/or weather conditions affect the type of outdoor exercise people engage in. Guide students to locate states on a map of the United States where people can swim during winter months (Florida, Hawaii). Have them point to states where people can snow ski during the summer. (Alaska, Colorado)

Assign part C, page 66, of the Student Resource Book.

Teacher Options

READING STRATEGY
After reading the lesson, help students draw a skeleton outline. Together list the main ideas from the lesson’s paragraphs in the outline form.

RETEACHING A Different Modality
**(Tactile)** To further help students determine where their muscles and bones are, instruct them to feel parts of their own bodies: ribs, shins, arms, skulls, and shoulders. Have students feel their lower leg and identify where they can feel bone (front) and muscle (back). Discuss how the bone makes the leg straight and the muscle gives the leg its round shape.
CONTENT OBJECTIVES

A. Describe how food and oxygen get to all parts of the body.
B. Describe the physical changes that occur when someone works or plays hard.
C. Tell why your body needs both exercise and proper amounts of rest.

Think! Decide what the body needs to prepare for heavy exercise.

ACTIVITY OBJECTIVES

Compare breathing rate before and after exercise.
Measure time in seconds and minutes.
Use a timer or clock to measure time.

FOCUSING THE LESSON

Vocabulary Ask students to tell why we place our right hand on our chest when we salute the flag. (To cover our hearts) Write heart on the chalkboard. Tell students that the heart is located in the middle of the chest. Write oxygen on the chalkboard and pronounce it for students. Tell them that oxygen is in the air we breathe.

Choose from the following warm-up exercises.

Getting Started Have students name ways in which they exercise. Call on volunteers to demonstrate some exercises. Then have them pantomime how their bodies react to heavy exercise such as running, hiking, or biking. (Panting, feeling overheated) Tell students that this lesson will help them understand more about how important exercise is for their bodies.

Warm-up Activity Explain to students that they can feel their blood being pushed by their heart at different places on their bodies. Help students locate the pulse points on their wrists and neck. Have students count the number of beats for thirty seconds while resting. (The average resting pulse rate for second graders is between 90 and 110 beats per minute.) Then have students jog in place for thirty seconds and count their pulse rates again. Have students compare the two rates. (The second should be higher.)

Answers will vary but should include games in which students are active, such as swimming, running, or jumping rope.

3. What happens when you exercise?

Getting Started What games give you the most exercise? How do you feel after you play these games?

Your heart pumps faster when you exercise. Your heart is a pump made of muscle. It pumps blood to all parts of your body. Find the swimmer’s heart.

Blood carries two things that your body parts need. It carries food and oxygen. Oxygen is a gas in air. Your body gets oxygen when you breathe.

Teacher Options

READING STRATEGY

Divide a chart into two sections. Label one part Rest, the other part Exercise. Tell students that the body requires both rest and exercise. Have them skim the lesson and then name things they can do to rest and other things they can do to exercise. List their suggestions on the chart. Have students read to find out how both exercise and rest help the body. After reading the lesson, have students contribute drawings and/or picture cutouts with labels to the chart.
Your heart pumps between 80 and 90 times a minute. Every pump is one heartbeat. Every pump sends food and oxygen to all parts of your body.

### DEVELOPING THE LESSON

**TEACHING/GUIDED LEARNING**

- Read the text on pages 268-269 with students. Ask: **Why is the heart the most important muscle in the body?** (It pumps blood throughout the body.)
- Have students try to make a fist 80 to 90 times in one minute. Ask: **Do you think you could keep doing this for one hour without stopping and without getting tired?** (No) Explain that our heart muscles move much like this, without stopping, every day of our lives.
- Have students study the drawing of the swimmer's circulatory system. Explain that the arteries carry blood from the heart to the rest of the body. The veins carry blood back to the heart. Explain that the blood receives nutrients from the food we digest, and the blood gets oxygen from the lungs.

**CHECK FOR UNDERSTANDING**

Ask: **How do your body parts get the food and oxygen they need?** (Blood contains the food and oxygen the body needs, and the heart pumps the blood to all parts of the body.)

- Have pairs of students take turns rolling their tongues up to the roof of their mouth, so that their partners can observe the blood vessels under the tongue. Students can see the blue lines under the tongue, which are veins, and the pink lines, which are arteries. (Students can also observe blood vessels in their wrists.)

### QUESTIONS STUDENTS ASK

**What does my heart look like?** The heart is not shaped like a valentine. Each heart is about the size of the person's fist, and weighs less than a pound. The heart is a strong muscle located in the chest, where it is tipped slightly to the left.

### SCIENCE CONNECTION

Explain that a smoker's heart and lungs do not work as well as those of a nonsmoker. Have students design posters to encourage people not to smoke. Have students provide reasons for quitting smoking and make up slogans for their posters. For examples, *You Smoke, I Choke and Lungs at Work—No Smoking.*

Use the following videodisc chapter to help students develop their understanding of the human body.

**SCIENCE HORIZONS Videodisc Concept Library, Volume B**

"Human Body"
Side A, Chapter 16
Have students interpret the pictures. Be sure they understand that the small closeup picture shows how the girl looks after she has been jumping rope. Then read the text together and have students answer the question. Ask: How do you know that your heart is working harder when you exercise than when you rest? (The heart beats faster and breathing is faster.)

Have students suggest different exercises and list them on the chalkboard. Possible suggestions include gymnastics, swimming, walking, and jogging. Then ask questions, such as: Which exercise would be best for making muscles stronger? (Swimming) Which exercise would be best for increasing flexibility? (Gymnastics) Which exercises would be best for making the heart stronger? (Walking, jogging)

CHECK FOR UNDERSTANDING

Ask: Why is exercise good for your health? (It helps strengthen the heart and other muscles and body parts.)

When you exercise, your muscles need a lot of food and oxygen. So do other body parts. That is why your heart beats faster.

When you exercise, your lungs work faster too. Have you ever played very hard? You get "out of breath." What does it feel like to be out of breath?

Answers will vary but may include that you breathe very short breaths and that your heart beats fast.

Teacher Options

MATHEMATICS-SCIENCE CONNECTION

Have students poll teachers and family members about the different kinds of exercises they do. Compile students' data on a bar graph. Help students analyze which form of exercise is the most popular and which is the least popular.

LIMITED ENGLISH PROFICIENCY

Brainstorm with students to form a list on the chalkboard of the various sports or types of exercise that they have either participated in or seen. Record all contributions. Then read aloud The Bicycle Man by Allen Say. You may need to read important sections several times to ensure comprehension. Then have students work in small groups to develop a pictorial story showing the major events in the story.
Rest also helps your body stay healthy. It is important to rest after you exercise. Rest also helps to keep your muscles and bones strong. It gives your bones a chance to grow. That is one reason why you need to get enough rest at night.

**Lesson Review**

1. What does the heart do?
   - How does your body change when you are working or playing hard?

2. Why is rest important?
   - Think! What could you do to get your body ready for a long race?

**CHECK FOR UNDERSTANDING**

Ask: Why does your body need a proper amount of rest? (To help keep muscles and bones strong.)

**Read and discuss the Lesson Review with students. The answers follow.**

**LESSON REVIEW** (Practice)

1. The heart pumps blood throughout the body.
   - Blood carries food and oxygen that the body needs for energy and growth. **OBJECTIVE A**

2. The heart and lungs work faster. A person may breathe faster or feel out of breath. **OBJECTIVE B**

3. Rest helps keep bones and muscles strong and gives the bones a chance to grow. **OBJECTIVE C**

**Think!** You could do exercises for a few weeks before the race to help strengthen your heart, lungs, and muscles. You could get a good night's rest the night before the race and eat energy-rich foods, such as pasta.

**3 CLOSING THE LESSON**

**LESSON SUMMARY**

Ask: What happens when you exercise? (Your heart and lungs work harder; exercise helps keep the body strong and healthy.)

Point out that in the next chapter students will be learning more about good health practices.

**LESSON CONNECTION**

**Life Science to Earth Science** Discuss with students why strenuous exercise is not recommended on very hot, humid days. (People can become overheated.) Discuss also the importance of wearing proper clothing when playing outdoors on cold, winter days and especially while playing in snow.

Assign part C, page 68, of the Student Resource Book.
Chapter Connections

Copy this word map on a piece of paper. Cut out the parts. Mix them up. Try to put them back together in the right order.

YOUR BODY

PARTS

CARE

- BRAIN
- NERVES
- SKELETON
- BONES
- MUSCLES
- HEART

HEALTHY FOOD

- SAFETY
- EXERCISE
- REST

Writing About Science • Inform

Write a sentence about something people wear that keeps their body safe. Draw a picture to go with the sentence.

Using the Graphic Organizer

- Put a copy of the graphic organizer on the chalkboard but omit the words under Care. Point to the word Brain and have students tell what they learned about the brain. Continue in this manner with the other words under Parts.
- Have the students read the word Care and ask them to think of what care has to do with parts. After a brief discussion, have students work in pairs to brainstorm ways that people can care for the body. Have partners share ideas with the class. Write phrases under Care as they are mentioned. Add additional boxes if students have other ideas that are included on the graphic organizer in the text.
- Conclude by having students compare their ideas with the ones on the graphic organizer in their text. You may want to point out that the text graphic organizer stresses the ideas discussed in the chapter but that other ideas are acceptable.

Chapter Connections

- Read Chapter Connections together. Have students copy the graphic organizer on the blank paper. Assist students with cutting out the parts and have them lay the parts on their desks.
- Ask a student to mix up the parts and phrases while your eyes are closed. Demonstrate putting the words and phrases back together in the right order. Conclude by telling students to mix up their words and phrases and then try to put them back together.

Writing About Science

- Write the topic Things People Wear for Protection on the chalkboard. Ask students to think of things that people wear to protect their body from injury. Call on volunteers to give ideas and record these on the chalkboard.
- Distribute writing paper and direct students to choose an idea from the chalkboard or another idea and write a sentence that tells about something that is worn for protection. If more direction is needed, write several sentences on the chalkboard. Have students draw a picture to go with their sentences.