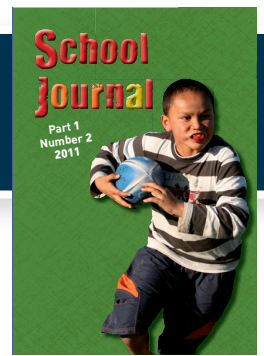


Mighty Muscles

by Sue Gibbison

School Journal
Part 1 Number 2 2011
Noun frequency level: 9–10
Year 4



Overview

In “Mighty Muscles”, Sue Gibbison explains how we build muscles and keep them strong, how muscles work, and how we can prevent injuries. The explanations are clear and simple, supported by photographs and three diagrams. The text is a

useful introduction to anatomy and has close connections with other items in this Journal. It also provides a good model for writing an explanation.

Texts related by theme

“Never Give Up!” SJ 1.2.11 | “Making the Team” SJ 1.2.11 | “Goosebumps and Butterflies” SJ 1.4.10

Text characteristics from the year 4 reading standard

some places where information and ideas are implicit and where students need to make inferences based on information that is easy to find because it is nearby in the text and there is little or no competing information

some words and phrases that are ambiguous or unfamiliar to the students, the meaning of which is supported by the context or clarified by photographs, illustrations, diagrams, and/or written explanations

a straightforward text structure, such as a structure that follows a recognisable and clear text form



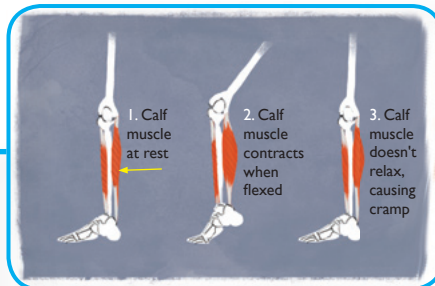
Preventing Injuries

Hard-working muscles need care. It's important to warm up before playing sport. Afterwards, it's important to cool down. Warming up and cooling down help to prevent injuries.

Stretching your muscles helps to keep them flexible. Stretchy muscles allow your body to move better. The more you can bend and turn, the better you will be at your sport.

Cramp

Cramp happens when a muscle stays tightly contracted. The muscle feels hard and sore. Gentle stretching can make it feel better.



Rest

When you sleep, your muscles relax. Your breathing and heart rate slow down. Hard-working bodies need a good rest each night. ■

some compound and complex sentences, which may consist of two or three clauses

other visual language features that support the ideas and information, for example, text boxes or maps

Reading standard: by the end of year 4

Possible curriculum contexts

HEALTH AND PHYSICAL EDUCATION

(Personal Health and Physical Development)

Level 2 – Personal growth and development: Describe their stages of growth and their development needs and demonstrate increasing responsibility for self-care.

ENGLISH (Reading)

Level 2 – Structure: Show some understanding of text structures.

ENGLISH (Writing)

Level 2 – Structure: Organise texts, using a range of structures.

Possible reading purposes

- To learn how our muscles work
- To find out how to take care of our muscles
- To explore the features of an explanation.

Possible writing purposes

- To research and explain how another part of the body works
- To create a poster, brochure, or blog entry about caring for our muscles.

See [Instructional focus – Reading](#) for illustrations of some of these reading purposes.

See [Instructional focus – Writing](#) for illustrations of some of these writing purposes.

Text and language challenges

VOCABULARY:

- Possible specialist or unfamiliar words and phrases, including “Mighty”, “muscles”, “gluteus maximus”, “stapedius”, “the right foods”, “Protein”, “soya beans”, “workout”, “relaxes”, “tightens”, “contracts”, “biceps”, “triceps”, “Wham!”, “Preventing”, “injuries”, “Stretching”, “flexible”, “Stretchy”, “Cramp”, “tightly contracted”, “heart rate”, “Hard-working bodies”
- The comparison “smaller than a flea”
- The word families for “strong” and “stretch”
- The colloquial expressions “Wham! It’s a goal!”
- The hyphenated adjective “Hard-working”.

Possible supporting strategies

Identify words, terms, and concepts that will be new to your students. Plan integrated ways to introduce vocabulary when you introduce the book and build prior knowledge. For example, use other resources, such as an anatomy chart that shows bones and/or muscles, as you discuss where our muscles are. Encourage the students to refer to the chart as they read, especially to find the bones and muscles shown in the diagrams on pages 28 and 31.

Review terms used to discuss healthy eating, probing for knowledge of the different food groups and where protein fits in.

Identify new vocabulary students should prioritise for learning. Have them record this vocabulary. Plan for ways to ensure they have opportunities to encounter this vocabulary often and in many contexts.

The English Language Learning Progressions: Introduction, pages 39–46, has useful information about learning vocabulary.

SPECIFIC KNOWLEDGE REQUIRED:

- Knowledge of anatomy, in particular, muscles and bones
- Understanding of the role that healthy food and exercise play in growth, development, and function
- Knowledge of the way muscles are built up and cared for before, during, and after exercise.

Possible supporting strategies

Find out how much students know about muscles and bones. You could create a class KWL chart and an associated vocabulary list or word map as part of the discussion. Review class and school discussions of healthy foods and why we need them.

When the students reach page 28, ask them to experiment with raising and lowering one arm while touching the biceps (when raising) and the triceps (when lowering). Discuss the results and relate this to the text.

TEXT FEATURES AND STRUCTURE:

- An explanation of muscles and how they work
- An introduction that gives facts
- Headings to indicate different subtopics
- Use of the timeless present tense
- Author addressing the reader as “you”
- Compound sentences that combine two contrasting ideas (“Your body can’t grow new muscles, but your muscles can grow bigger.”)
- The construction “The more ..., the bigger ...”
- The use of diagrams.

Possible supporting strategies

Ask students to skim-read the text, focusing on the headings and the photos and diagrams, to predict what each section will be about.

During reading, point out and discuss a compound sentence that contrasts two ideas. Ask them to find more examples and discuss them during and after reading and during writing.

Instructional focus – Reading

Health and Physical Education (Personal Health and Physical Development, level 2 – Personal growth and development: Describe their stages of growth and their development needs and demonstrate increasing responsibility for self-care.)

English (Level 2 – Structures: Show some understanding of text structures.)

| Text excerpts from “Mighty Muscles” | Students (what they might do) | Teacher (possible deliberate acts of teaching) |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>To build strong muscles, you need to exercise and to eat the right foods.</p> <p>Protein helps to build strong muscles. You can get protein from foods like eggs, meat, fish, and cheese. There’s protein in nuts and soya beans, too.</p> | <p><i>The students ask and answer questions that enable them to make simple inferences, for example, that protein is a “right food”.</i></p> <p><i>Students make connections between the text and their own eating habits. They may use the information in the text to evaluate the protein content of their own diet.</i></p> | <p>EXPLAIN the strategy of asking questions. For students who need a lot of support, be explicit about how the structure of the text and our expectations guide us in our questions.</p> <ul style="list-style-type: none">• Good readers ask questions in their heads as they read. This strategy helps you to focus as you look for answers in the text and think about those answers. <p>MODEL asking questions.</p> <ul style="list-style-type: none">• As I read this extract, I asked myself a series of questions, using my knowledge of the topic and of text structure. Some of them were answered right away. I wondered:<ul style="list-style-type: none">> What’s the “right food”, what is protein, and what foods have protein?• I found the answers to all my questions right there in the text, except for “What is protein?” I’m going to research that one later. Asking questions and searching for the answers helped me to really understand what I was reading. <p>PROMPT students to work with a buddy to ask questions about another paragraph.</p> |
| <p>Muscles can pull, but they can’t push. They work together to get things done. Some muscles work in teams, and some work in pairs. One muscle in a pair relaxes, and at the same time the other tightens (contracts).</p> | <p><i>Students use their knowledge of sentence structure, commas, and the conjunctions “but” and “and” to understand the way muscles work. They use their vocabulary knowledge and the word “tightens” to understand the subject-specific words “relaxes” and “contracts”.</i></p> <p><i>Students also make connections between the text and their experiences of pushing and pulling to visualise the actions of muscles.</i></p> | <p>EXPLAIN compound sentences.</p> <ul style="list-style-type: none">• Compound sentences put two ideas together. Each part (idea) could stand alone as a simple sentence. Authors use conjunctions like “but” or “and” to show the relationship between the two ideas.• In the first sentence, “but” tells us that there is a difference or contrast between the ideas.• What does “and” tell you in each of the next two compound sentences? <p>ASK QUESTIONS to help students work out vocabulary.</p> <ul style="list-style-type: none">• How do you feel when you’re relaxed?• How can you use your understanding of relaxing to imagine what a muscle does when it relaxes? (Support students to understand that words often have slightly different meanings in different contexts.)• What might help you to understand “contracts”? |
| <p>Cramp</p> <p>Cramp happens when a muscle stays tightly contracted. The muscle feels hard and sore. Gentle stretching can make it feel better.</p> | <p><i>Students make connections between the text and their own experiences of having cramp to understand why it is painful. They cross-check with the diagram to confirm the areas where they have felt cramp.</i></p> <p><i>Students also make connections between the text and seeing athletes receive massage during a game to infer that massaging a cramped muscle can make it feel better. They infer that massage is a way of stretching the muscle gently.</i></p> | <p>ASK QUESTIONS to support making connections.</p> <ul style="list-style-type: none">• Have you ever had cramp or seen someone with cramp? How does it feel?• In the diagram, what part of the body would be feeling pain from cramp?• Sometimes we see rugby players and other athletes getting massage during a game. Why do you think this is?• What connections can you make between massaging a sore leg and this text? <p>GIVE FEEDBACK</p> <ul style="list-style-type: none">• I noticed how you went back to the <i>Never Give Up!</i> article to check on the stretching exercises the boys did. You’ve made a great connection between these texts, and that has helped you understand more about muscles.• You asked questions while you were reading. Were they all answered by the text? What questions do you still have? |

METACOGNITION

- Which strategies did you use the most when reading this text? Why was that?
- How did asking questions help you to work out unfamiliar vocabulary? What sort of questions were the best for helping you?
- How did you use the photos and diagrams as you read? Were you able to create your own pictures in your head as well? If so, how did they help you to understand the text?

Reading standard: by the end of year 4
The Literacy Learning Progressions
Assessment Resource Banks

Instructional focus – Reading

Health and Physical Education (Personal Health and Physical Development, level 2 – Personal growth and development:

Describe their stages of growth and their development needs and demonstrate increasing responsibility for self-care.)

English (Level 2 – Structure: Organise texts, using a range of structures.)

Text excerpts from “Mighty Muscles”

You have more than six hundred muscles in your body.

Your biggest muscle is the one you sit on. It’s called the gluteus maximus. Your smallest muscle is deep inside your ear, and it’s smaller than a flea. Its name is stapedius.

Did you know?

- A smile uses 15 muscles.
- A frown uses 40 muscles.
- Walking uses 200 muscles.

For example, the muscles in your arm work in pairs. Your biceps muscle is in the top of your arm. It contracts to pull your arm up. When your biceps relaxes, the triceps contracts. It pulls your arm down again.

Examples of text characteristics

FACTS TO ENGAGE THE READER

An informational article needs facts. Starting an article with interesting facts is an effective way to set the scene and engage the reader. Facts that amaze, intrigue, excite, or amuse can get an article off to a great start.

FACT BOX

Fact boxes are a structure often used in informational texts. They add additional, interesting information that is related but not central to the main idea of the article.

EXPLANATION

An explanation helps the reader to understand an important idea or process. Explanations describe how or why something happens or works and are often supported by diagrams.

Teacher

(possible deliberate acts of teaching)

ASK QUESTIONS to support students to organise their writing.

- How will you start your article?
- What facts and figures will engage your readers?
- What kind of information will help your readers make connections with your topic?
- Have you stated your topic? Have you defined it clearly?

The introduction to an explanation also gives the topic, including definitions of some kind. This more basic point might be the focus with students who need a lot of support, while also noting the facts chosen are engaging.

EXPLAIN that authors use a range of structures within their writing.

- Interesting information can be included in different ways. One way is to use a fact box. When you’re deciding how to organise information, ask yourself:
 - > Will this fit with my purpose?
 - > Will it interest my audience?
 - > How important is the information to the main idea?
- A fact box is a good way to use information that is interesting but not directly related to the main idea. It still has to fit your purpose for writing though!

MODEL planning an explanation.

- When I want to explain how something works or why something happens, I plan it out first. I start by writing the purpose at the top: it’s easiest to write this as a question, such as “How does exercise build strong muscles?”
- Next, I list all the details I think are important. I review them and make sure they are in the right order. I search for any extra information I need and add that.
- Next, I think about who my audience is and how I will organise the information to best suit them.
- Then I write the explanation into correct sentences and ask a friend to read it to check they can understand it. I might need to add a diagram to make my explanation even clearer.

Provide support such as a graphic organiser if necessary. Some students may need help to find the best details or to simplify a complex explanation. Encourage students to choose simple ideas that they can find information about easily.

Use a writing frame for students who need more support. See <http://englishonline.tki.org.nz/English-Online/Teacher-needs/Pedagogy/Cross-curricular-strategies/Teaching-approaches-and-strategies/Writing/Writing-frames> for ideas. You can construct writing frames that offer various levels of support. If possible, provide opportunities for students who speak languages other than English to discuss and plan their writing in their first language.

GIVE FEEDBACK

- Using a diagram really helped me to understand what you meant and clarified your description.
- The structure you’ve used takes your readers through the ideas one at a time, and the examples help make each idea very clear. That will definitely help your readers.

METACOGNITION

- Why did you choose to write an article about this? What information did you want your readers to understand?
- How did you plan your writing? Why did you choose to structure it that way?
- How have you helped your readers to make connections to what they already know?