

TEACHER GUIDE

EVALUATE LESSON 24



Module Questions: *Why are there so many changes to my body during exercise? How does milk help our bodies recover from these changes?*

What We Figure Out:

During different types of workouts, the body uses different amounts of energy. We figured out that the body uses glucose for aerobic and anaerobic respiration to generate energy for the muscles during shorter-duration exercise. Glucose can come from muscle glycogen, liver glycogen, and from food. The body also uses fatty acids to make ATP during longer-duration exercise. We have figured out how milk nutrients provide glucose to the bloodstream, which can be used right away in aerobic or anaerobic respiration. Glucose from milk can also help to replenish muscle and liver glycogen for later use. We revise our presentations to communicate scientific information that we have learned in the module to answer the Driving Question, *How can milk help athletes recover from physical exercise?*

3D Learning Objective:

Students **use multiple formats to communicate** how the internal conditions of the human body **change** in response to changes in external conditions (exercise, drinking milk).

Time estimate:

100 minutes

Materials:

Lesson 24 Student Guide
Lesson 24 Teacher Resource Rubric
Lesson 24 Student Handout Self-Evaluation
Lesson 24 Student Handout Peer Feedback Form

Targeted Elements

SEP:

INFO-H5:

Communicate scientific and/or technical information or ideas (e.g. about phenomena

DCI:

LS1.A-H1:

CCC:

SC-H1:



and/or the process of development and the design and performance of a proposed process or system) in multiple formats (including orally, graphically, textually, and mathematically).	<p>Systems of specialized cells within organisms help them perform the essential functions of life.</p> <p>LS2.B-H1: Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes.</p>	Much of science deals with constructing explanations of how things change and how they remain stable.
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Directions



Part 1: Our Motivation

USE OF PHENOMENA

In this lesson, students will use what they have figured out about the Module Phenomenon to return to the Anchor Phenomenon and develop a presentation of this new scientific information to the selected audience.

Prompt students to consider where the class stands in explaining the Module Questions, *Why are there so many changes to my body during exercise? How does milk help our bodies recover from these changes?* In student responses, listen for the following:

- We know how the body uses blood glucose for aerobic and anaerobic respiration to generate energy for the muscles.
- During different types of workouts, the body uses different sources of energy, such as glucose or fatty acids.
- We have figured out how milk nutrients provide glucose to the bloodstream, which can be used immediately in aerobic or anaerobic respiration or can be stored for later use as glycogen.

Direct students' attention to their Anchor Phenomenon presentations from Lessons 1, 7, and 14. Ask students how they think what they have figured out since they last updated their presentations will help them modify or add to their presentations. Students should respond to this question in their Lesson 24 Student Guide Part 1: Our Motivation.

- Listen for student responses that indicate students have some new information now to communicate how milk nutrients are available to help the body recover from different-intensity workouts.

Build off student responses to share what we have figured out about how the body obtains energy for exercise and how it recovers from doing so will help us reassess the presentation and add new scientific information to the original explanations. You can also point to any student questions on the Driving Question Board in the categories “Exercise, Milk, and Energy” and “Recovery from Exercise.” Direct students' attention to their presentations and share that they will now present the new evidence they have gathered in the module to their selected audience.



Part 2: Communicating Scientific Ideas

Share that students will now again have an opportunity to revise their presentations to share the new scientific information they gathered about how milk can help athletes recover from exercise. This presentation should include students' ideas about the new scientific mechanisms they have obtained evidence about in this module and how and why they think milk helps the body recover from exercise. Explain that they can build upon their presentations from Lessons 1, 7, and/or 14, revise and/or add to them, or start a new presentation entirely.

Review the list of presentation format requirements and the presentation development steps with students. Remind students that the presentation should be designed for the same chosen audience and with the same format they selected in Lesson 1, and that this is their first opportunity to communicate the scientific ideas they learned in this unit. Reinforce that across the unit, they will have additional opportunities to revise and improve their presentations based on new learning and feedback. Share that students can use any of the resources from the module to support them in the performance assessment task in this lesson.

To support students in developing their presentations, explain that in each module, they will develop one component of their final presentation for the unit. Clarify for students that each component is like a mini-presentation to share their understanding of the scientific ideas they learned in the module. Convey that at the end of the unit, they will combine their mini-presentations about each module's question into one final presentation that reflects their knowledge of the entire system and answers our Driving Question for the unit.

STUDENT SUPPORT

To share the value of revising presentations, share with students that scientists often gather new information through research and experiments that can add to or alter their original thinking. It is important for students to use a process of evaluating scientific information after they have obtained it and share it with others to share new ideas and receive feedback. You may ask:

- How will this new information change what you previously presented on?

- How might you present this new scientific evidence?
- What new ideas or understanding might it bring up for the intended audience?

Encourage conversations between students before they begin revising their presentations.

STUDENT SUPPORT

The scaffold table for preparing a presentation previously included in Lessons 7 and 14 is intentionally not included in the Lesson 24 Student Guide. This is to give students an opportunity to develop their script independently. You have the option to share the scaffold table with any students who may still need the additional support.

Direct students to the Look Fors on their Lesson 24 Student Guide Part 2: Communicating Scientific Ideas to serve as a checklist or outline to help draft their presentation. Read the Look Fors together, and share that students can use these Look Fors as a guide on how to achieve proficiency on the task. You can use the Lesson 24 Teacher Resource Rubric to assess students' performance on this task.

TEACHER SUPPORT

In this lesson, students are only evaluated on the new module content. This is reflected in the sample student responses in the Lesson 24 Teacher Resource Rubric. Students may, however, choose to incorporate information from other modules into their presentation.

As students revise their presentations across the unit, remind them to collect each of their presentation drafts in a portfolio so they can see how their presentation has progressed over the course of the unit.

Ask students to use the space on their Lesson 24 Student Guide Part 2: Communicating Scientific Ideas to prepare their presentation script or written report so it is ready to deliver and record. Do a quick review of each group's script or outline prior to allowing time for students to develop their full presentation. As students work, circulate the room and ask pressing questions such as:

- Where in the module did you find this new scientific information?
- Why are you including this new scientific information in your presentation?
- Is there any evidence that you are still unsure of? Which ones? Why?
- What do you now know about milk's role in exercise recovery?
- How has your thinking about milk's role in exercise recovery changed because of this new scientific information?

CCSS SUPPORT

WHST 9-10.5 Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

Utilize the questions above to provide additional support. If needed, meet individually with students to offer specific feedback in regard to the writing process.

After you review and approve each group's script or outline, let students know they can continue to develop their full presentation. If doing a written presentation, direct students to create the formal writing product. If doing a video presentation, direct them to rehearse and record the video product.



Part 3: Sharing Presentation Drafts and Receiving Feedback on Our Presentations

You can now use a peer feedback protocol to have students provide feedback on each other's presentations. At the bottom of the Lesson 24 Teacher Resource Rubric, there is guidance for how to support students in using a peer feedback protocol and an activity to discuss and norm on what features of high-quality student presentations look like and how to support students in using the Lesson 24 Student Handout Peer Feedback Form. Use either or both to have students reflect on and improve their work should you decide that additional steps are needed for your class to achieve proficiency. Alternatively or additionally, you can collect student presentations and provide feedback to each group using the provided Rubric and Look Fors.

STUDENT SUPPORT

If needed, return to the class list of norms developed in Lesson 1 for how students engage in productive and respectful classroom discussions. Remind students of the class list with the norms the class generated and hold students accountable for participating in these norms throughout the unit.

TEACHER SUPPORT

In the peer feedback protocols, you might consider having students pair in the same partner groups across all Lessons 7, 14, 24, and 31 for consistency. This may make the feedback students receive more meaningful as their peer groups will become more familiar with each other's presentations over time. Alternatively, you could have students rotate partner groups to make the process more challenging.

To conclude this portion of the performance task, remind students they will have time in the final performance task of the unit to revise their presentations based on the peer and teacher feedback they receive.



Part 4: Navigation to the Next Module

Ask students what they think they need to figure out next to help make additional progress on the unit Driving Question. Listen for responses such as:

- We don't know what happens to the protein in milk to help with recovery.
- We don't yet know how muscle soreness happens during exercise.

Build off student responses to focus on muscle soreness and protein in milk. Direct the class back to the Driving Question Board and point out the "Milk Protein and Muscle Soreness" and "Recovery From Exercise" categories of questions.

Student answers may look like:

- Are muscles affected by exercise? How? Why?
- How does protein help with exercise recovery?
- Does milk help muscle soreness go away?
- Does milk help build bigger muscles?
- What is recovery from physical exercise?
- What factors indicate your body has or has not recovered from exercise?
- What does our body lose during exercise, and how do we replenish it?
- What processes is the body using for recovery after physical exercise?

Share that in the next module, students will focus on how milk helps in muscle recovery from soreness induced by intense exercise.

STUDENT SUPPORT

Give students the opportunity for self-assessment by having them complete Lesson 24 Student Handout Self-Assessment, which includes the SEP Engagement Self-Reflection and Presentation Self-Reflection. This is an optional activity to help students reflect on their learning in this module and their engagement with the communicating information SEP. This self-assessment can give insight into how students

feel engaging with this SEP. It also offers insights into how the students improve on this practice throughout each module. After completing this form, students may share their responses with an elbow partner or submit them directly to the teacher.