

TEACHER GUIDE

EVALUATE LESSON 7



Module Question: *How is milk digested after it is consumed?*

What We Figure Out:

We realize several organs are involved in digestion, and each has specialized cells responsible for secreting specific enzymes and breaking down and recombining certain components as part of their essential functions. Each plays an important role in digesting milk into the essential nutrients the body needs during recovery from exercise. We develop a presentation to communicate scientific information 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 of communication** and **orders of magnitude** to explain how **body systems and specialized cells contribute to the digestion of milk**.

Time estimate:

100 minutes

Materials:

Lesson 7 Student Guide
Lesson 7 Teacher Resource Rubric
Lesson 7 Student Handout Self-Evaluation
Lesson 7 Student Handout Peer Feedback Form

Targeted Elements

SEP:

INFO-H5:

Communicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats

DCI:

LS1.A-H1:

Systems of specialized cells within organisms help them perform the essential functions of life.

LS1.A-H3:

CCC:

SPQ-H4:

Using the concept of orders of magnitude allows one to understand how a model at one scale relates to a model at another scale.



(including orally, graphically, textually, and mathematically).

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

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 Question, *How is milk digested after it is consumed?* In student responses, listen for the following:

- We know how the nutrients in milk are broken down in the body.
- We know what nutrients are available during exercise recovery.
- We have new scientific information that we can communicate about how milk nutrients are recombined during digestion.

Direct students' attention to their Anchor Phenomenon presentation from Lesson 1. Ask students how they think what they have figured out will help them modify or add to their original presentation. Students can respond to this question on their Lesson 7 Student Guide Part 1: Our Motivation.

- Listen for student responses that indicate that students should have some new information now to communicate how milk nutrients are digested and chemically recombined to be available for the body during exercise recovery.

Build off student responses to share what we have figured out about milk digestion will help us reassess the presentation and add new scientific information to the original explanations. You can also point to any remaining student questions on the Driving Question Board in the categories "What's in Milk?" and "How Does My Body Digest Milk?" Direct students' attention to their presentations and share that they will present the new evidence they have gathered in the module to their selected audience.



Part 2: Communicating Scientific Ideas

Share that students will now 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 the module and how and why they think milk helps the body recover from exercise. Explain that they can build upon their presentation from Lesson 1, revise and/or add to it, or start a new presentation entirely.

Read through the updated list of presentation format requirements and the presentation development steps with students. In particular, note to students that their presentation should be designed for the same chosen audience and with the same format they selected in Lesson 1. Explain that this is their first opportunity to communicate the scientific ideas they learned in this unit. Assure students 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.

Next, direct students' attention to the tips to help create an effective presentation. Read through each tip together as a class. For each tip, have students brainstorm ideas as a class about how they could use these tips in their presentation and concretely what that might look like in different presentation formats. Individual student groups can then draw from this brainstormed list when working on their presentations.

Direct students to the Look Fors on their Lesson 7 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 7 Teacher Resource Rubric to assess students' performance on this task.

TEACHER SUPPORT

As students revise their presentations across the unit, ask them to collect each of their presentation drafts in a portfolio. This will allow students to see how their presentation has progressed over the course of the unit.

To get started, students should use the space on their Lesson 7 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:

- How do you think this presentation will make sense to your chosen audience? What will be clear for them? What will be difficult?
- How are you communicating the idea that multiple different scales are important in digestive functions? How can orders of magnitude help you do so?
- How are you showing how the molecules in milk are digested? How are you showing the role of specialized cells in this process?

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 regards 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. Refer to the last page of the Lesson 7 Teacher Resource Rubric for guidance on how to discuss and norm on what features of high-quality student presentations look like and how to support students in using the Lesson 7 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

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 feedback activity.

TEACHER SUPPORT

In the peer feedback protocols, you might consider having students pair in the same partner groups across 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 first portion of the performance task, tell 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

To begin to transition 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 amino acids, fatty acids, sugars, water, and electrolytes once they go into the bloodstream.
- We don't yet know how amino acids, fatty acids, sugars, water, and electrolytes help recovery from exercise.

Build off student responses and focus on water as it has entered the bloodstream. Direct the class back to the Driving Question Board and point out the “Exercise, Milk, and Hydration” category of questions.

Point out several student questions that connect to what students identified they need to figure out more about. Example student questions to highlight:

- Why does a body need to hydrate as part of exercise recovery?
- How does water in milk help with recovery?
- What happens in the body after it is hydrated?
- Does the amount we sweat impact the amount of fluids we need to replenish?
- Does drinking specific items, like milk, increase hydration only? Are there other effects?

Share that in the next module, students will focus on the role of water in exercise recovery.

STUDENT SUPPORT

Give students the opportunity for self-assessment by having them complete Lesson 7 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.