Tips & Tricks from OEI

Metabolic Reactions

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<th>Standards</th>
<th>Focal SEPs</th>
<th>Focal CCCs</th>
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| 8. MS-PS1-1, 8.MS-PS1-2, 8.MS-LS1-5 (partial), 8.MS-LS1-7 | • Analyzing and Interpreting Data  
• Engaging in Argument from Evidence  
• Developing and Using Models  
• Asking Questions and Defining Problems  
• Planning and Carrying Out Investigations  
• Constructing Explanations and Designing Solutions | • Systems and Systems Models  
• Structure and Function  
• Energy and Matter  
• Patterns  
• Cause and Effect |

DESE Guidance
(You’ll need to download the file from the list at the bottom of the page.)

The OpenSciEd approach to these standards will look...

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<th>More Like This</th>
<th>Less Like This</th>
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| • Students engaging with a doctor’s note of a middle school student who is experiencing changes in her health  
• Students diving deep into one system and food molecules being processed, and relate it back to how different body systems work together  
• Students then transferring what they learned about the human body to other living organisms | • Students learning about the systems of the body with readings and long lists of vocabulary  
• Students memorizing parts of each body system and their functions, and taking quizzes and tests that require rote memorization  
• Students completing isolated activities about different body systems and/or parts of the body |

In each lesson’s teacher guide, you will find:
• On the first page, information about the lessons that come before and after this one  
• Immediately following, the Lesson Level Performance Expectations (LLPEs) show what students will do in this lesson; these can be used as daily objectives  
• Detailed materials list and notes on materials prep for this lesson  
• Learning Plan Snapshot for an overview of each part of the lesson including timing and materials needed  
• Where We Are Going and Where We Are NOT Going: This is really important for defining the goals of this lesson in the context of the unit. Refer to this often while planning for discussions!  
• Suggested prompts and predicted student answers embedded into each lesson plan  
• A list of Key Ideas for most discussions

Meeting Students’ Needs
• OpenSciEd centers the needs of Emerging Multilingual Learners. For more info, go to page 47 of the OSE Teacher Handbook.  
• OpenSciEd incorporates the principles of Universal Design for Learning.

Accessing Materials
• Preview the unit materials - view only access to OSE materials for each lesson. You can make a copy of these and save them in your own drive so that you can modify the files as you wish.  
• Download materials - resources are available in several different formats  
• OEI Shared Resources Folder - place for teachers to upload and share teacher-created materials)
Storyline Highlights/Summary

Page 29-30 of the Overview Materials shows three lesson sets:

- **Lesson Set 1** presents a complicated health case of a middle school student named M’Kenna. Students investigate a healthy digestive system and compare it to M’Kenna’s case through hands-on labs, data sets, readings, and computer interactives.

- **Lesson Set 2**, students develop understanding of how food molecules are rearranged in the body to create energy, store matter, and use matter for growth. Students apply these ideas to M’Kenna’s case to connect to how different body systems work together and can explain the way that M’Kenna is feeling.

- **Lesson Set 3** is a transfer set from humans to other living things. Students apply previous models and what they’ve learned to a summative assessment on bear hibernation.

The storyline for this unit has more detail about the flow of the lessons. This lesson breakdown might be helpful for getting an overview of the lessons.

**Critical Discussions**

It can be tempting to focus on the consensus discussions toward the end of each lesson set. These ARE important, and so are the building understanding discussions that come before them. If the concepts you are trying to bring students to consensus on are not well understood, consensus discussions can actually be counterproductive. So, don’t rush through those conversations! This unit heavily incorporates building understanding discussions.

Spotlight on the Teacher’s Guide

The Overview Materials document has a lot of good info!

- **What additional ideas will my students have or know from earlier grades or OpenSciEd units?** (Starts on p. 31) This section includes DCIs, SEFs, and CCCs.

- **How will I need to modify the unit if taught out of sequence?** (Starts on p. 34.) Massachusetts moved this unit from 7th to 8th grade. Many key ideas students need for this unit come directly from Chemical Reactions & Matter and Chemical Reactions & Energy units. Other key ideas come from Thermal Energy and Matter Cycling & Photosynthesis in 7th grade and Cells & Systems in 6th grade. Students should not struggle with the change in grade level.

- **Assessment Opportunities:** The Assessment System Overview starts on p. 40. Lesson By Lesson Assessment Opportunities starts on p. 43.

Materials Concerns

In this unit, 5 lessons have intense materials preparation expectations: 3, 5, 10, 11, 12. Most of these involve managing safety considerations for food and open flame. However, if food and/or open flame is not allowed in your classroom, there are videos available for those investigations.

Remember, there are teacher preparation videos (pg. 4-5) to help you set up the materials-intensive investigations. You can preview which lessons have more expected materials prep time on this lesson breakdown.

Sidebars in the Teacher Edition

Many lessons have sidebars in the step-by-step learning plan section of the teacher’s edition. It is worth skimming that section before you teach the lesson. You’ll find several types of sidebars:

- **Supporting Students in...** [specific science and engineering practice or cross-cutting concept]: These sidebars will often point out where students may have missing background knowledge, with suggestions for how to address those, as well as highlight connections you should help students make across lessons.

- **Attending to Equity:** These sidebars usually have ideas for how to help ensure the content of the lesson is accessible to all students, and may include universal design for learning tips for teaching the lesson with students who have IEPs and emerging multilingual learners.