



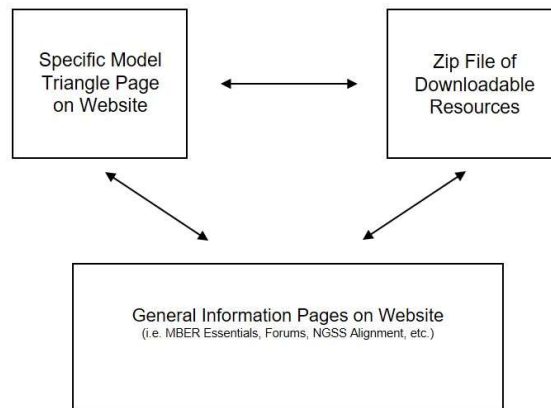
How to Use MBER-Bio Curricular Resources

How do you prepare to teach an MBER unit using the resources here in conjunction with the repository of information on the MBER Biology website?

Introduction

Our goal is to provide NGSS-aligned materials designed to help you facilitate modeling and sensemaking in your science classroom. In this guide we offer information on how to use the materials on the website to plan instruction.

There are three elements you will need to examine to make sense of each model triangle. Two of these are specific to the triangle and the third is more general. All are found on the MBER-Bio website (www.modelbasedbiology.org).



The Model Triangle Page

A unit's model triangle page allows you to track the threads through a unit from a higher altitude. It shows a summary view of the phenomenon/a, question/s, and model ideas, contains an overview including the transitions in and out of the unit to help situate it in the broader curriculum, and it shows the stepwise flow through the unit in the Learning Segment Table. This page will also include information about advanced planning and outside resources that may be of particular use in your preparation. (Advanced planning information and supply lists can be found in full detail by navigating to MBER Essentials.)

It is at the bottom of this page where you will find the Downloadable Resources link.

The Zip File of Downloadable Resources

All materials developed by the MBER Team have been provided in an open source format. You will find editable files as well as ready-to-print PDF files for students. Everything is organized for you in the PowerPoint file that includes *student-facing slides* **and** an embedded *teacher manual* in the form of teacher-facing slides and presenter notes (particular to the slide at hand).

The full roster of any compressed materials (zip) file on the website will generally include:

A Read Me First File (this file)

- PowerPoint File
- Learning Segment Table (for teachers)
- Doodle Sheet (for students)
- Resources Specific to Individual Learning Segments
- Occasional Supplemental Guides

Most documents will be provided in both a printer-friendly format (PDF) that is ready for students or for your own use as well as an editable format (usually in Microsoft Word format). Providing you with editable versions of these open-source materials is part of our design commitment: we want you to be able to alter the resources for your students and the specific needs of your site and student population.

The PowerPoint

As mentioned above, the PowerPoint file is the center of the curricular resources for each unit. When you plan you should have the PowerPoint along with the Learning Segment Table and Doodle Sheet in front of you. The second slide in the PowerPoint file contains detailed information about how the slideshow is structured and what you must do to prepare it for use in your classroom.

The Learning Segment Table

The LST provides a “lesson sequence” style overview of the unit and is the same as the one that lives on the website. You should immediately note that a learning segment does not correspond to a classroom period. Rather, it reflects a cohesive “chunk” of instruction as related to the PQM Triangle. Are we exploring the phenomenon (the “P” on the triangle)? Are we offering initial ideas to answer our driving question (a question to model move, represented as $Q \rightarrow M$)? Learning segments can be as short as 5 minutes or as long as 3 days.

Each learning segment is also reflected in the structure of the PowerPoint. We have used section breaks to correspond to learning segments. Each set of student slides is bracketed by a teacher-facing “Learning Segment Overview” and a “Learning Segment Summary” that directly re-state the learning segment description and “What we’ve learned...” columns of the LST respectively. In some cases, an additional column appears in the print/document version of the LST in the zip file: “Model Ideas Generated” helps to track the approximate appearance of each component of the model in the sequence of learning segments. Having the Learning Segment Table available during your planning process is therefore critical to your understanding of how ideas are offered, evaluated and solidified through the unit.

(A note about PowerPoint “sections”: for those using Google Drive/Google Slides to create a repository of the curricular resources, be aware that you may lose the “sections” feature of the slide deck upon conversion. You will still be able to track learning segments, however, as the teacher slides that begin and end the segment will remain intact.)

The Doodle Sheet

Whereas the teacher-facing slides in the PowerPoint and the LST support teacher understanding of units/model triangles, the Doodle Sheet supports and tracks coherent student understanding across days. *Typically there is a single Doodle Sheet for the whole unit.* Doodle Sheets provide a space for students to record their thoughts, questions, nascent ideas and often the ideas of others in the classroom. In this way they provide the students with a record of their thinking as it evolves over the course of a unit. Student-facing PowerPoint slides will prompt students to write and record on the Doodle Sheet, indicating a particular (lettered) box wherein to complete the task. Having the Doodle Sheet out as you move through the student-facing slides in your planning will help you to coherently track ideas from the student's perspective. For more information on how to use Doodle Sheets, please see the Teacher Toolkit within the MBER Essentials on the MBER-Bio website.

Learning Segment–Specific Resources

The remainder of the zip file contains all of the specific resources for each learning segment in the unit. You will find both print-ready (PDF) and editable versions for most of these documents. You'll notice that the file names for these resource not only contain the unit abbreviation but also a two digit number. The number indicated the learning segment where you will need the resource. For example, S 04 Finch Reading indicates that you will provide the reading to your students during Learning Segment 04. The resources that correspond to each learning segment are additionally indicated in a list that appears on the "Learning Segment Overview" teacher slide for each segment in the PowerPoint. If a particular learning segment needs anything other than the Doodle Sheet & PowerPoint, you'll find it in the "Learning Segment Resources" directory in the zip file. NOTE that if there are no such additional resources for a learning segment, all you will need is the Doodle Sheet and PowerPoint.

Supplemental Teacher Guides

Occasionally, you will find additional resources for teachers in the zip file for a unit. Many of these documents can be found as pages on the website as well but some will be specific to the model at hand.

General Information Pages on Website

Many members of the MBER community freely admit that once they've downloaded the curricular resources, they rarely return to the website. We feel strongly that your enactment of sensemaking using our curricular resources is enhanced by regular interaction with the website. Here, we briefly describe a few ways to support your understanding of a unit using the web-based materials.

MBER Essentials

Though we would prefer to provide every MBER user with an in-person PD experience, we have at least tried to populate the website with information about our philosophy, a guide to the fundamentals of MBER (and model-based reasoning in particular), a number of pedagogical supports/tools, and nuts-and-bolts info that might appeal to your admin (such as the pages about NGSS alignment). We've attempted in many places to point to the MBER Essentials that are particularly germane at moments in the curriculum. Developing your own habits around going to the web repositories, however, will provide you with an arsenal of strategies that will eventually aid in your "personalization" of the curricular resources. (For example, don't like the gallery walk suggested in the slides for a particular lesson, try reading about the "Silent Board Meeting" in the MBER Essentials Teacher Toolkit.)

The Forums

Lastly, we suggest all new members make use of the forums on the website. Besides the general forums that track conversations about pedagogy, materials and stumbling blocks, there is a dedicated forum to each model triangle. Looking for a resource we didn't put together? A fellow teacher in the community might have exactly what you need—and they may have already shared it.

Thanks for reading. We hope this helps your process.

Happy planning!
-The MBER Team