

Dear Teacher,

The MARE NGSS K/1 curriculum has been designed to support both you and your students in your understanding of what it means to do and teach science as called for in the Next Generation Science Standards (NGSS). NGSS asks teachers and learners to use a three-dimensional approach to instruction and learning, bringing together content (disciplinary core ideas), what scientists/engineers do (science and engineering practices), and big ideas that cut across science disciplines (crosscutting concepts). In designing the MARE NGSS K/1 curriculum, we intended to model an approach to three-dimensional instruction that could be used throughout the academic year, even when teaching other science units. To this end we created materials that are explicit in their three-dimensionality to both the students and the teacher, as well as educative for the teacher. These materials also support many aspects of Common Core ELA and math at each of their grade levels. Additionally, students are diving into some really engaging and exciting content and experiences.

In order to be explicit to both teachers and students about the three-dimensional nature of NGSS (and science!), we have created Science Ideas walls that are built and added to throughout each unit. The walls are broken into three categories—*Key Concepts*, *What Scientists Do*, and *Making Connections* (see example below). *Key Concepts* represent the content that students learn through the activities (similar to the ideas presented in the disciplinary core ideas within NGSS). *What Scientists Do* represents the science and

**Science Ideas**

Key concepts	What Scientists Do	Making Connections
A <u>habitat</u> is a home and has everything an animal needs to survive.	<b>Communicate information</b> It is important to record observations using words and drawings so we can tell others about what we have discovered.	Scientists look for patterns.
An animal's <u>habitat</u> must provide food, water, air, shelter, and space.	<b>Make and use models</b> Sometimes scientists create models of organisms and habitats so that they can learn more about them.	
Our desktop ponds are models of real ponds.	<b>Support ideas with evidence.</b> Scientists use observations and look for patterns when trying to answer questions about the world. These can be used as evidence.	

engineering practices of NGSS. And *Making Connections* represent the crosscutting concepts that cut across different disciplines of science and within a particular discipline. As students learn and apply each of these aspects of science, what they are learning or doing is explicitly called out and added to the Science Ideas wall. In this way, the ideas and practices can be revisited repeatedly throughout the unit, and even the school year.

We have also called out the rationale for many of the instructional practices that support student discourse or understanding of particular science practices. You will often find the rationale embedded in a *Note to the teacher* box next to the particular student activity. At times alternatives or suggestions to further support students are provided in these boxes as well. We hope that these notes will help support your instructional decision-making as you teach the unit.

All MARE materials are written with a learning cycle instructional design approach. This means that students are provided with: an *invitation* to engage with the content that connects prior knowledge and experiences to the topic of study; opportunities for open-ended *exploration* of real phenomena, followed by discussion about learner discoveries, ideas, and questions that arise, providing a common base of experiences for learners to develop current concepts, skills, and processes; some direct instruction and content delivery as well as opportunities for students to develop their own

conceptual statements by reflecting on what they have learned through explorations (*concept invention*); opportunities to *apply* what they have learned to novel contexts; and time to *reflect* on their learning and how they have come to understand what they currently understand. Not all opportunities are provided in every session. However, throughout a conceptual thread—such as the model pond activities in sessions 1-11 of the Ponds unit, students experience all aspects of the learning cycle, and many are experienced multiple times.

We hope you enjoy what we've created, and we're always open to suggestions. If you have any feedback, please contact us at [weisse@berkeley.edu](mailto:weisse@berkeley.edu) and [spedemonte@berkeley.edu](mailto:spedemonte@berkeley.edu) or by phone at 510-643-6350 or 510-642-5008.

We look forward to hearing from you!

Sincerely,

Emily Weiss and Sarah Pedemonte

## The Learning Cycle

