

F E B R U A R Y 2 0 1 2

the Carbon TIMEs



Andy's Message

We are excited to see all your comments and assessment results coming in. Congratulations to Cindy Jatul for being the first teacher to report all of her data from her teaching! As soon as we finish the pilot versions of the units, we will be starting the revision process, and we will be paying special attention to the unit-specific information you supply—your comments on the Wiki, your focus students' work, and your unit pre-post tests. So please keep us informed about how your units are going. We have several new pilot items on the teaching materials site or coming soon:

- A supplemental activity for the *Systems and Scale* unit that introduces students to the tools for investigations (balances, BTB, and soda lime) and to Tools for Reasoning—molecular models and the Process tool—using a simpler system than alcohol burning: Soda water losing its fizz.
- A revised Teacher's Guide for the *Decomposers* unit.
- Coming soon: the pilot version of the *Ecosystems* unit. We're excited about the simulation game we are developing for this unit!
- Updates to materials and teacher's guides for other units—there are red notes with dates of revisions.

We will have one more pilot unit to complete after this—the one on *Human Energy Systems*. We will share highlights of this unit in our next Newsletter. We really appreciate the fine work you are doing in helping us turn these pilot units into much more coherent units for our next round of testing!

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You might be a Carbon TIME teacher/researcher if...

“...you look at a bag of moldy bread on your pantry shelf and say out loud “Oh, I’d better take this to school and mass it; it’s science, not trash!”

-Liz Ratashak, teacher

“...you get to play games in meetings!”

-Hannah Miller, researcher

“...you go to ordinary stores and buy ordinary things in an abnormally large quantity (e.g., 500 meal worms) and get strange looks from the store employees.

Apparently it’s weird to buy 500 meal worms with no animals to feed them to, and to instead claim that I’m feeding the worms themselves.”

-Staci Sharp, project manager

“...you find yourself counting out batches of 50 mealworms with one hand, and eating your lunch with the other hand.”

-Jenny Dauer, researcher

Lindsey’s Big News!

We are excited to share the exciting announcement that Lindsey Mohan Hawkins and her husband John are expecting **twins** in August! Many of you who know Lindsey from MSU research projects in the past may know that Lindsey is an identical twin herself: “It’s amazing what medical technology can do nowadays! My mother didn’t even know she was having twins until she was 8 months pregnant!” If you want to send Lindsey a congratulatory email you can reach her at lindseymohan@gmail.com. Congratulations, Lindsey!

Notes from the Field

“Control on the left and test on the right. Soda lime results confirmed the mass lost by the mealworms was gained by the soda lime :) Yea, Mealworms!”

-Liz Ratashak, Vicksburg High School, Kalamazoo, MI →

Liz’a Data (Day 1)

Soda lime with worms= 32.65 g

Mealworms= 14.50 g (**over 100 worms!!**)

Soda lime control = 32.88 g

On **Day 2** soda lime with worms increased 2.6 g, mealworms decreased 0.37 g, soda lime increased 1.59 g.

Note: in our Teacher’s Guide we recommend 50 mealworms-- you need much more!!

Trivia Question

Which of these natural events affect the climate?

- Thawing permafrost
- The path of the Earth around the sun
- Volcanic eruptions
- All of the above



What's new on the Wiki & Website

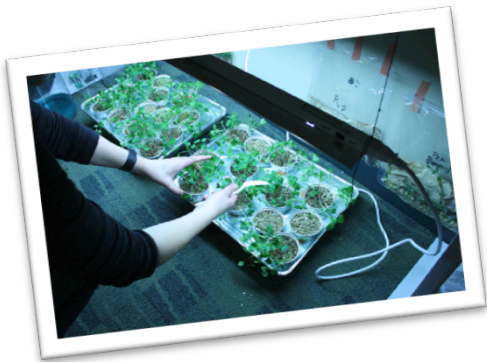
Teacher Contributions

Debi Kilmartin posted her own “Teacher Friendly” version of the **interview protocol**.

Liz Ratashak posted a simplified **practices chart** that you might want to use as you teach the units. She also posted a **power point** to help explain what happens to monomers and polymers in digestion and biosynthesis, which includes an “exit ticket” assessment item at the end, as well as two quizzes she made to accompany the plants unit.

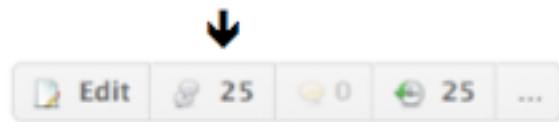
Mary Grintals posted a modified **process tool** that she found helpful with her students. Have a look and let us know what you think!

Staci has also added a new page on the wiki called **Staci's Corner**. The new Staci's corner page includes the CarbonTIME twitter feed, a link to the Environmental Literacy Website, Consent Forms, the Card Receipt form, testing information, and other helpful tips.



Discussion Forums

Have a question that you want to share with other teachers? Want feedback on an idea? Need help with an investigation from other teachers? Our wiki now has a discussion board forum! To find it, click on the button with the talk bubbles next to the “Edit” button. It looks like this:



Once you are on the discussion forum page, notice the “Questions from Teachers” thread where you can post any question. Feel free to post your own new discussion thread, too. If you'd like to be emailed when someone posts on a thread, click “monitor this topic” at the bottom of the question post.

Reminders

If you've distributed gift cards to students for interviews, please send in the completed gift card receipts. Some of the cards have come out of pocket, and your project manager can't get reimbursed until you send them in!

We need signed consent forms for the student interviews! If you've already sent in the interview tapes, please get those forms in ASAP.

Facebook & Twitter



Carbon TIME has a new Facebook group! The Facebook group has 13 members and counting and we would love for you to join if you are a Facebook user. It is a “secret group,” which means that Staci needs to invite you to join. If you are interested in joining, send Staci Sharp a message on Facebook or email her at sharpst5@msu.edu.



Carbon TIME also has a Twitter account! You can follow us @CarbonTIME to keep up with Carbon TIME announcements and also news about climate, environment, and education. You can also find our running Twitter feed on the homepage of the wiki, and on the new wiki page called “Staci's Corner.”

Dear Staci

Video Taping

Dear Staci: I am about to video tape a lesson in my classroom. Where is the best place to put the camera?

Staci: For us, the most important part of the video taping of any lesson is the whole class discussion. Really, any place in the room is fine as long as we can **hear** you, **hear** the students, and **see** the board. You might want to try to put the camera near the front of the room with the camera pointed towards you and the board. Also, make sure to put the microphone on “wide capture” instead of “directional.” This will allow the camera to pick up more of what the students are saying.



Data, Data, Data!

Dear Staci: I have a bunch of collected data from the investigations I have done in class. Do you want it for any reason?

Staci: Yes! One goal of our investigations team at MSU is to create good data sets for each investigation. This will be useful for teachers as back-up data in case something goes awry in the classroom. It may also be useful for teachers to see the end production before they begin! If it went well we will add it to our archive to share with other teachers. If it did not go well, we want to learn from it. Please send your data to Jenny Dauer dauerjen@msu.edu.



Online post test

Dear Staci: Can you remind me of the instructions for getting my students logged on to take the post test online?

Staci: Sure! You'll need to login as yourself (hopefully you still remember your login and password—if not, let me know). On the left hand side, go to "Courses and Students" under the Teacher Resources heading. Select the Exam Strand "Carbon TIME." After you set up the post test, assigning it to your respective classes, your work is done. When students go to take the test, they'll select their names from the login page, based on the information in the drop down menus. All the students will need to be provided is the basic passcode you've assigned for this particular exam.

Slow Mealworms

Dear Staci: My mealworms are not very active, and I'd like to get some new worms that are a little healthier. Can I get new worms?

Staci: Yes, of course! Data collection is very important, so we will support this to the best of our ability. I can order new mealworms online and have them shipped to your house or school. If you'd like to buy them yourself, just send me the receipt and we'll reimburse you.

Investigating the Investigations

A small team at Michigan State University is working on all of the unit's investigations to be sure they will work well in the classroom. That includes plants, mealworms, fungus on jello, combustion and club soda (the people in our office building think we're weird). We have already learned a lot from this work and will try to pass on the information to you as soon as possible! If you have particular questions or comments about the methods for the investigations, please feel free to send them to us.

One key thing we are working on is to be sure that when your students do the Plant Growth Investigation, that plants gain more weight than the soil loses. From three teacher's sets of student data, we are finding that students lose vermiculite when working with the plants *by as much as 1 g*. The three data sets show mean vermiculite loss as 0.7 ± 0.4 g, 0.3 ± 0.5 g and 0.4 ± 1.4 g. *That means we need plant mass change to be well over 1 g!* We are currently trying a plant experiment where we grow 30 radish seeds per cup, with lights on for 24 hours, over the span of 3 weeks. We're also considering options that would use paper towels instead of soil. Stay tuned!!



Make BTB in a gallon jug! Here's how BTB works: in solutions with pH > 7.1 BTB is blue. When CO₂ dissolves in water, it forms a weak acid (carbonic acid), which makes the pH of pure water as low as 5.5. Most tap water had too many ions in it that buffer the pH of the water, making it slow to acidify with added CO₂. So, it is essential that distilled water be used when making BTB solutions. One quick way to make a batch is to use a plastic gallon jug of distilled water and add about 100 mls of BTB. Ready to go!



Spotlight on the Undergrad

Meet Courtney Lannen, a new member of the Carbon TIME project. Courtney is a senior biology major at Michigan State University, and has been working with Jenny Dauer on the investigations. Here's what Courtney has to say about joining Carbon TIME: "I joined Carbon TIME because my goals as a future science teacher include preparing students to be well-rounded critical thinkers and to be literate on environmental issues. My role in Carbon TIME is testing out the experiments and investigations-- I try to solve any challenges that arise and ensure we provide teachers with the best laboratory protocol possible. I really enjoy the day to day tasks of running the experiments. Much of what I have learned working on Carbon TIME will prepare me for my teaching career. I hope to teach biology, chemistry, and Spanish at a secondary level."



 Welcome,
Courtney!

Important links

Carbon Time Wiki:

<http://carbontime.wikispaces.com>

Environmental Literacy Homepage:

<http://edr1.educ.msu.edu/EnvironmentalLit/index.htm>

Facebook Group: Carbon TIME

Follow us on Twitter: @CarbonTIME

Carbon TIME Comics



Trivia Answer

D All of the Above

Peat bogs play an important role in maintaining climate. **Permafrost** in the Northern Hemisphere is an important carbon sink but when it thaws exposing peat bogs, captured carbon and methane is released into the atmosphere. The greenhouse gases released from peat bogs can amplify climate change.

Changes in the Earth's **orbit** around the sun can also affect the climate. These changes, as well as changes in the tilt of the Earth on its axis, are part of what are known as Milankovitch cycles, which are linked to the timing of ice ages.

Volcanic eruptions have been known to greatly affect global temperatures in the past — the 1815 eruption of Tambora caused 'The year without a summer' in 1816 — ash, rock and sulphur particles in the atmosphere increased cloud cover and reflectivity (albedo), causing widespread global cooling.