

April Is  
**National Poetry Month**

# Observe, Explain, Connect

An interdisciplinary lesson using poetry and science highlights the parallels of the disciplines while developing literacy.

By Sylvia M. Vardell and Janet S. Wong



In his article “Physics and Poetry: Can You Handle the Truth?” astrophysicist Adam Frank (2013) revealed, “Poems and poetry are, for me, a deep a form of knowing, just like science . . . each, in its way, is a way to understand the world.” Poets and scientists both seek to observe, explain, and understand the world around them. Poetry’s brevity, conceptual focus, and rich vocabulary make it a natural teaching tool for connecting with science, particularly in celebrating National Poetry Month each April and “Poem in Your Pocket” day, April 24, 2014 (see Internet Resources). Akerson (2002) reminds us: The “processes of science and literacy learning are similar and may help the development of each



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discipline.” She goes on to observe: “Using an interdisciplinary strategy can help meet state and national science objectives in a way that supports language arts” (p. 22).

Like science, poetry often involves a high level of abstraction in language and ideas, requiring specific critical-thinking skills and promoting interaction. Casteel and Isom (1994) acknowledge, “The literacy processes are the means by which science content is learned because content information is rooted in written and oral language” (p. 540). Infusing poetry into the science curriculum can serve to jump-start or introduce a topic, present examples of terminology or concepts, provide closure that is concept-rich, or extend a science topic further. The brevity of poetry is less intimidating to children who may be overwhelmed by longer prose and streams of new vocabulary, especially for students acquiring English as a new language. We can introduce or reinforce a science topic with a poem in just a few minutes with language that is rich, vivid, and memorable and activities that are engaging and interactive. Of course a poem alone is not intended to be the entire science lesson, but it offers an innovative, engaging, and vocabulary-full and concept-rich way to launch or conclude a science lesson. Royce, Morgan, and Ansberry (2012) confirm this, stating “studies have shown gains in literacy as well as science achievement in programs that blend science and literacy instruction” (p. 6).

Many thematic poetry collections are devoted to science-related subjects, such as animals, weather, seasons, and space (see NSTA Connection for a list of recommended titles). The annual list of Outstanding Science Trade Books for Students K–12 typically includes one or two new books of science-themed poetry every year (see Internet Resources). As we consider the *Next Generation Science Standards (NGSS)*, we can explore how poetry might work alongside other texts and experiences to help students understand what the Standards describe as our “technology-rich and scientifically complex world” (NGSS Lead States 2013). Akerson (2002) reminds us that the “use of language arts to promote literacy and support learning in other content areas is (also) recommended and encouraged by the International Reading Association (IRA) and the National Council of Teachers of English (NCTE)” (p. 22).

## Sharing Science Poetry

How can we share science poetry with young people while incorporating NGSS skills and still maintain the joy and pleasure of poetry? In the *Poetry Friday Anthology* series, the phrase “Take 5” from the great jazz musician Dave Brubeck was applied to taking time for poetry every Fri-

day to introduce and share a poem. The “Take 5” approach is based on a constructivist model of learning and encourages engagement and exploration in particular. The latest in the series, *The Poetry Friday Anthology for Science* (Vardell and Wong 2014) focuses exclusively on poems rich in science content and includes a poem a week for the whole school year for every grade level K–5 on topics ranging from lab safety to famous scientists to exploring force, motion, and energy. “Take 5” activities are provided for every poem at every grade level tied to the *Next Generation Science Standards (NGSS)* while also incorporating the literacy skills identified in the *Common Core State Standards (CCSS)*. The strategies presented in this article are based on this resource.

Why Fridays? Much like “casual Friday” in the corporate world, there is a perception that on Fridays we can relax a bit and take a moment for something special. We can capitalize on the Poetry Friday concept in the classroom or library and take five minutes every Friday to share a science poem. Any book of science-related poetry can jump-start Poetry Friday poem sharing, such as the *National Geographic Book of Animal Poetry* edited by J. Patrick Lewis (2012), a collection of 200 animal poems with lots of teaching potential.

## Take 5: Steps for Sharing Poetry

What are the five components of the “Take 5” approach to poem sharing? Let’s consider each step:

1. The first step in sharing a poem is to read it aloud to the students. Poems are meant to be heard, just as songs are meant to be sung. Practice reading the poem aloud a few times to get comfortable with the words, lines, pauses, and rhythm. Display the words of the poem on a poster or chalkboard or with an overhead or digital projector. Seeing the words while hearing them provides additional reinforcement for students learning to read or learning English.

As we get more comfortable and experienced in reading poems aloud, we can experiment with different ways of making the poem come alive by pairing the poem with a prop, adding gestures or movement, trying out specific choral and dramatic reading techniques, and so on. If the poem has active verbs in it, add motions or pantomime to the reading. If a physical object is referenced, plan ahead to have that object ready as a poem “prop.” Some poems can be read aloud to a soundtrack of relevant music or sound effects or with images projected (like nature photos). Other poems may incorporate a few challenging vocabulary words that may need a bit of brief explanation before reading. Invite students to close their eyes and

**FIGURE 1.**

Sample lesson plan.

**Using Poetry to Jump-Start a Science Lesson****Standard K-ESS3-3: Human Impacts on Earth Systems**

Things that people do to live comfortably can affect the world around them. But they can make choices that reduce their impacts on the land, water, air, and other living things.

**Introduce Your Topic with the “Take 5” Approach to a Poem**

A poem alone is not intended to be the entire science lesson, but it offers an innovative way to launch a science lesson.

WEEK 20: NATURAL RESOURCES
FIRST GRADE

**RECYCLING**  
by Susan Blackaby

Collect the daily scraps and clippings,  
gather up the bits and snippings:  
Paper, plastic, glass, and tin—  
all of these go in the bin.  
Once it's sorted and inspected,  
so-called waste is redirected.  
Think of all the things that you  
can make from useful stuff you threw  
away!

Take 5!

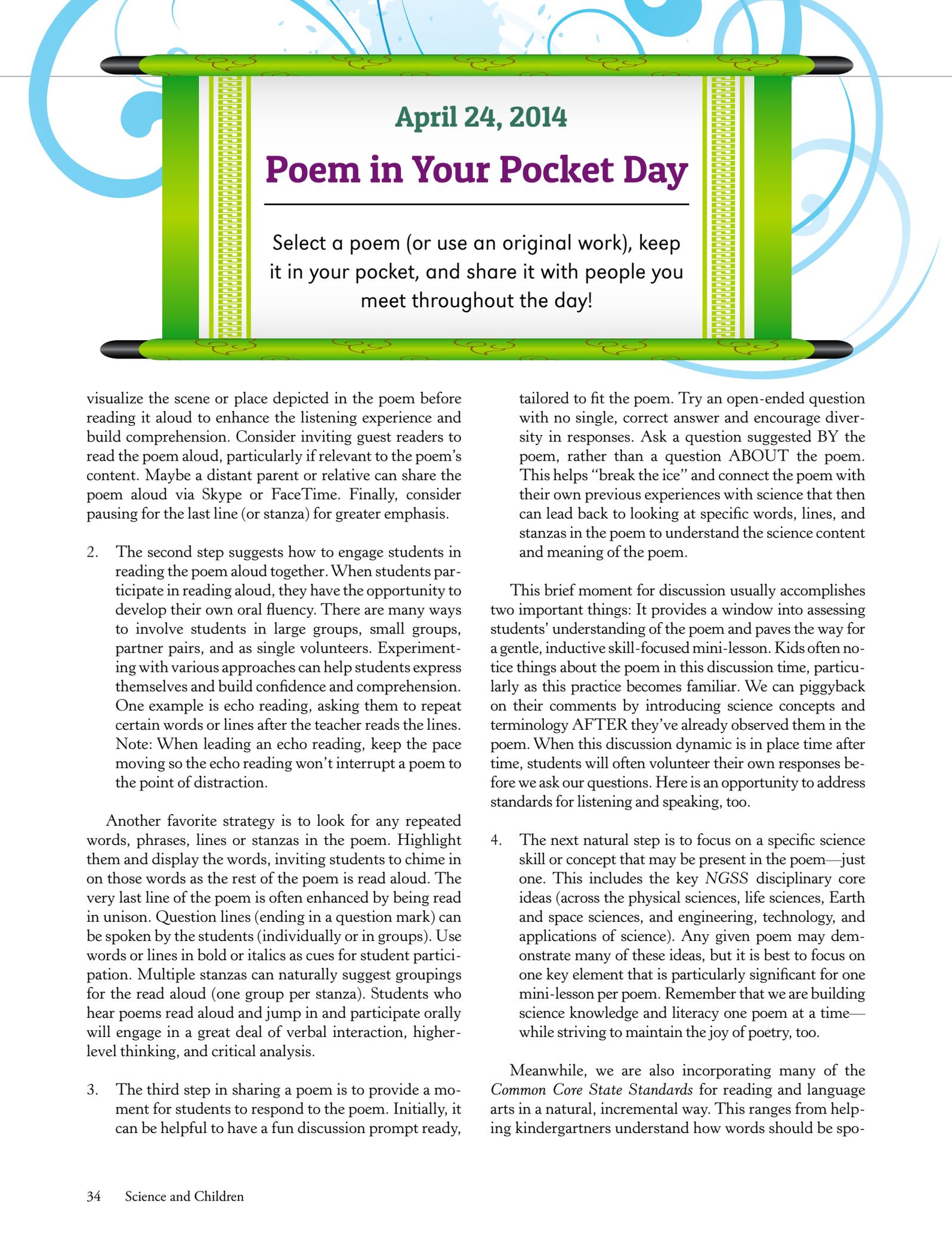
1. **Pile some trash in front of you as your poetry prop** (be sure to include some items that could be recycled). Then read the poem aloud.
2. Read the poem aloud again and **invite students to chime in on the words and phrases that describe what can be recycled:** *scraps and clippings; bits and snippings; paper, plastic, glass, and tin.* You read the rest of the poem aloud.
3. For discussion: ***What kinds of things do you recycle at home?***
4. **Guide students in identifying recyclable items** mentioned in the poem (*paper, plastic, glass, and tin*) and beyond and find examples of these in your classroom, showing children the recycling symbol on items that contain it. Gather one day's worth of scrap paper in a pile to demonstrate how small amounts of paper can add up.
5. Revisit last week's poem about environmentally responsible practices, **"Magic Show" by Juanita Havill**, about composting (1st Grade, Week 19). Just for fun, check out *The Green Mother Goose; Saving the World One Rhyme at a Time* edited by Jan Peck and David Davis.

THE POETRY FRIDAY ANTHOLOGY FOR SCIENCE

**Follow a “Take 5” Poem with a Science Lesson and Activity about Recycling**

After introducing science vocabulary and concepts in a poem, students are ready to dive into ready-made science lessons such as the PBS Kids lesson on “Recycling: Reduce, Recycle, Reuse” ([http://www.pbskids.org/eekoworld/parentsteachers/lessons\\_k\\_1.html](http://www.pbskids.org/eekoworld/parentsteachers/lessons_k_1.html)).

A fun follow-up activity is the FOSS game “Materials of Our World/Recycling Center” ([http://www.fossweb.com/delegate/ssi-foss-ucm/Contribution%20Folders/FOSS/multimedia/Materials\\_in\\_our\\_World/recycling\\_final/index.html](http://www.fossweb.com/delegate/ssi-foss-ucm/Contribution%20Folders/FOSS/multimedia/Materials_in_our_World/recycling_final/index.html))



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## Poem in Your Pocket Day

Select a poem (or use an original work), keep it in your pocket, and share it with people you meet throughout the day!

visualize the scene or place depicted in the poem before reading it aloud to enhance the listening experience and build comprehension. Consider inviting guest readers to read the poem aloud, particularly if relevant to the poem's content. Maybe a distant parent or relative can share the poem aloud via Skype or FaceTime. Finally, consider pausing for the last line (or stanza) for greater emphasis.

2. The second step suggests how to engage students in reading the poem aloud together. When students participate in reading aloud, they have the opportunity to develop their own oral fluency. There are many ways to involve students in large groups, small groups, partner pairs, and as single volunteers. Experimenting with various approaches can help students express themselves and build confidence and comprehension. One example is echo reading, asking them to repeat certain words or lines after the teacher reads the lines. Note: When leading an echo reading, keep the pace moving so the echo reading won't interrupt a poem to the point of distraction.

Another favorite strategy is to look for any repeated words, phrases, lines or stanzas in the poem. Highlight them and display the words, inviting students to chime in on those words as the rest of the poem is read aloud. The very last line of the poem is often enhanced by being read in unison. Question lines (ending in a question mark) can be spoken by the students (individually or in groups). Use words or lines in bold or italics as cues for student participation. Multiple stanzas can naturally suggest groupings for the read aloud (one group per stanza). Students who hear poems read aloud and jump in and participate orally will engage in a great deal of verbal interaction, higher-level thinking, and critical analysis.

3. The third step in sharing a poem is to provide a moment for students to respond to the poem. Initially, it can be helpful to have a fun discussion prompt ready,

tailored to fit the poem. Try an open-ended question with no single, correct answer and encourage diversity in responses. Ask a question suggested BY the poem, rather than a question ABOUT the poem. This helps “break the ice” and connect the poem with their own previous experiences with science that then can lead back to looking at specific words, lines, and stanzas in the poem to understand the science content and meaning of the poem.

This brief moment for discussion usually accomplishes two important things: It provides a window into assessing students' understanding of the poem and paves the way for a gentle, inductive skill-focused mini-lesson. Kids often notice things about the poem in this discussion time, particularly as this practice becomes familiar. We can piggyback on their comments by introducing science concepts and terminology AFTER they've already observed them in the poem. When this discussion dynamic is in place time after time, students will often volunteer their own responses before we ask our questions. Here is an opportunity to address standards for listening and speaking, too.

4. The next natural step is to focus on a specific science skill or concept that may be present in the poem—just one. This includes the key NGSS disciplinary core ideas (across the physical sciences, life sciences, Earth and space sciences, and engineering, technology, and applications of science). Any given poem may demonstrate many of these ideas, but it is best to focus on one key element that is particularly significant for one mini-lesson per poem. Remember that we are building science knowledge and literacy one poem at a time—while striving to maintain the joy of poetry, too.

Meanwhile, we are also incorporating many of the *Common Core State Standards* for reading and language arts in a natural, incremental way. This ranges from helping kindergartners understand how words should be spo-

ken, spelled, read, and written to helping fifth graders understand how figurative language such as metaphors and similes function in poetry and how stanzas and line breaks help shape a poem.

- Finally, in this last step we share other related poems and books that connect well with the featured poem. Look for another poem by the same poet, another poem about the same subject, or a related book of nonfiction. Once the students have been immersed in a dozen poems or more, THEY will be making those connections themselves. Keep science poetry books handy for easy reference and revisit favorite poems. A quick oral sharing of a popular poem can be a great way to start or end the day, a lesson, or a library visit. We can use a poem to line students up or while transitioning to the next activity.

These steps can be applied to any poem in any book for a quick and meaningful way to introduce and integrate poetry and science, building science literacy in incidental, but intentional ways. Such poetry moments can enrich science learning, be part of science instruction, offer content-rich poetry lessons in reading and language arts, or simply provide fun Poetry Friday sharing. Obviously, poetry sharing doesn't take the place of planned science instruction, but the two complement each other well. Taking the curriculum and goals into account, you should consider pairing poetry with your science lessons week by week. This might be accomplished by using the index found in each poetry book to identify relevant science topics. See NSTA Connection for an example of how the NGSS core ideas are incorporated in one collection of science-themed poetry and how individual weekly poems and science topics align. See Figure 1, page 33, for a sample science-themed poem, "Recycling" by Susan Blackaby (2010) and the "Take 5" steps for sharing that poem excerpted from *The Poetry Friday Anthology for Science*. Then, to take those steps further, look for exemplary lesson plans for building environmental awareness and teaching about reducing waste (see Internet Resources).

## Conclusion

The more connections we can provide between what children are learning in science and what literacy skills they need to be successful, the deeper their learning of both will be. If poetry can be that vehicle for connecting skills, concepts, and information across the science curriculum, we owe it to children to infuse poetry wherever we can. In sharing science-focused poetry, we can encourage children to think like a poet AND a scientist carefully observing the world around them using all their senses, maintaining an avid curiosity about how things work, and gathering "big

words" and key vocabulary in their reading and their writing. As Albert Einstein reminds us, "Logic will get you from A to B. Imagination will take you everywhere." ■

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## References

- Akerson, V.L. 2002. Teaching science when your principal says, "Teach language arts." *Science and Children* 38 (7): 42–48.
- Blackaby, S. 2010. *Nest, nook, and cranny*. Watertown, MA: Charlesbridge.
- Casteel, C.P., and B.A. Isom. 1994. Reciprocal processes in science and literacy learning. *The Reading Teacher* 47 (7): 538–545.
- Frank, A. 2013. Physics and poetry: Can you handle the truth? NPR: [www.npr.org/blogs/13.7/2013/07/09/200064088/physics-and-poetry-can-you-handle-the-truth](http://www.npr.org/blogs/13.7/2013/07/09/200064088/physics-and-poetry-can-you-handle-the-truth).
- Lewis, J.P. 2012. *The National Geographic book of animal poetry*. Washington, DC: National Geographic.
- NGSS Lead States. 2013. *Next Generation Science Standards: For states, by states*. Washington, DC: National Academies Press.
- Peck, J., and D. Davis. 2011. *The green mother goose: Saving the world one rhyme at a time*. New York: Sterling Publishing.
- Royce, C.A., E. Morgan, and K. Ansberry. 2012. *Teaching science through trade books*. Arlington, VA: National Science Teachers Association Press.
- Vardell, S.M. and Wong, J.S. 2014. *The poetry Friday anthology for science*. Princeton, NJ: Pomelo Books.

## Internet Resources

- Environmental Awareness Lesson Plan: Reducing Waste  
[www.brainpop.com/educators/community/lesson-plan/environmental-awareness-lesson-plan-reducing-waste/](http://www.brainpop.com/educators/community/lesson-plan/environmental-awareness-lesson-plan-reducing-waste/)
- FOSS Materials of Our World Recycling Center  
[www.fossweb.com/delegate/ssi-foss-ucm/Contribution%20Folders/FOSS/multimedia/Materials\\_in\\_our\\_World/recycling\\_final/index.html](http://www.fossweb.com/delegate/ssi-foss-ucm/Contribution%20Folders/FOSS/multimedia/Materials_in_our_World/recycling_final/index.html)
- National Poetry Month  
[www.poets.org/page.php/prmID/41](http://www.poets.org/page.php/prmID/41)
- Outstanding Science Trade Books for Students K–12  
[www.nsta.org/publications/ostb/](http://www.nsta.org/publications/ostb/)
- Recycling: Reduce, Recycle, Reuse  
[www.pbskids.org/eekoworld//parentsteachers/lessonsk\\_1.html](http://www.pbskids.org/eekoworld//parentsteachers/lessonsk_1.html)

## NSTA Connection

Download a list of recommended poetry books and an NGSS disciplinary core idea reading guide for *The Poetry Friday Anthology for Science* (Vardell and Wong 2014) at [www.nsta.org/SC1404](http://www.nsta.org/SC1404).