Poetry in Science: Improving Clarity, Creativity, and Collaboration

BY KATIE COPPENS

Evolutionary biologist Richard Dawkins said, “There are those who fear reason as cold, bleak, cheerless, unpoetic. That’s not just untrue; it’s the very opposite of true. Science is the poetry of reality” (Dawkins 2016). Science is reminiscent of art, dance, and writing; after close study and reflection, we express what we believe to be true. Science is about better understanding the world around us, then communicating what we’ve learned.

When the scientific approach of inquiry, observation, and analysis is combined with the artistic writing of poetry, an audience can be engaged to better understand science through a creative style that resonates. This can be seen through the work of scientists and in the classroom.

Astrophysicist Dr. Grant Tremblay, of the Center for Astrophysics: Harvard & Smithsonian, wrote a poem “I am sorry” in April of 2019 in response to criticism about the quality of the first image of a black hole at the center galaxy M87, which was taken through a network of radio telescopes. His tweet received over 28,000 likes. See poem in Figure 1.

As El Niño builds, Pacific Warm Pool expands, ocean gains more heat

The use of poetry in science is a colorful combination of self-expression and comprehension. In the classroom, much like these scientists have modeled, students can write poems to communicate their knowledge through concise, well-chosen language; however, there’s an added benefit when collaborative poems are written because they enhance students’ engagement as well as their communication skills. Two examples of collaborative poetry are poems for two voices and group poems.

**Group or whole class poem**

Any topic in science that has a sequence, such as the Moon’s phases, mitosis, or the life cycle of stars, can be written as a group

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**FIGURE 1:** Dr. Grant Tremblay’s “I am sorry” poem.

i am sorry

that the image
whose Earth-sized baselines
yielding a 20 μas beam
resolving 5 Schwarzschild radii
whose deconvolution
placed 10 resolution elements
over a ~15 light day black hole shadow & photon ring
in an object 55 million light years away

was too blurry for you
poem with each student writing one component and the poems coming together to form one large poem. If the topic has a long enough sequence, it can involve all members of the class.

As seen in the NSTA Press’s *Creative Writing in Science: Activities that Inspire* (Coppens 2016), a whole-class poem can be done about the topic of Earth’s history. Students are given a period from Earth’s geologic timescale that they’re responsible for, such as the Ordovician or Triassic Period. Students receive a slip of paper with their number in the sequence, the name of the period, the years it took place, and a few key events that occurred during that time (see Earth’s history group poem activity in Supplemental Materials). Next, all students are provided with two websites as a starting point for researching to obtain or enhance knowledge about their topic.

After they research and before writing the poem, it helps students to generate a list of essential scientific vocabulary, concepts, and species to incorporate. From their original research, students highlight or circle what they think are the most important concepts to include in their poem (Figure 2). Teachers could also provide some of the essential vocabulary to include, which could be particularly useful for English learners (ELs). It is also helpful for the teacher to assist with pronunciation of words for all students, such as writing *Cambree-an* for the Cambrian Period.

The next class begins by introducing five different forms of poetry: free verse, haiku, tanka, cinquain, and rhyming poems with models for each type and a poem written by the teacher about Precambrian time (see forms of poetry and examples in Supplemental Materials for this lesson). The rest of the class is devoted to writing the poems. In general, students enjoy that poetry does not have the same convention rules as other forms of writing and that their main goal is to convey information with a poetic style of their choice. When writing, have students move their seats so that they sit near those who are writing poems that occur before and after their poem in the sequence. Some students have chosen to end and start their poem with the same word or idea; an example of this can be seen in Figure 3 with one student’s poem about the Ordovician period and another student’s poem following it about the Ordovician-Silurian mass extinction.

At the start of the following class, the students sit in a circle and read the poems in the sequential order of Earth’s geologic time periods (Figure 4). Bright yellow cards that say, “Mass Extinction!” are held by students to indicate where the five major mass extinctions took place.
visually in the sequence of Earth’s timeline. The simplicity and complexity of poetry created much opportunity for differentiation, where all students felt both included and challenged by this assignment. For example, an accommodation made for a student with functional life skills IEP goals was to record the reading of his poem ahead of time. For the group poem, a laptop was placed in front of him, and when it was his turn, a recording of him reading his poem was played.

Many students were nervous about reading their poems, so it was essential to make sure they were confident in their pronunciations. I have a microphone in my room that’s connected to speakers that I use for students with an accommodation of hearing support. During the readings, we pass a small microphone around which helps us hear students who speak quietly, and the movement of the microphone helps students know when to start. After the group poem is complete, it’s important to reflect on and discuss how each student’s individual work came together to create this larger poem and what they learned about Earth’s history and poetry from this experience. The class also reflected through an exit slip, where one student stated, “I learned some things that I definitely didn’t know before we did the poem activity, and I also learned more when we listened to my classmates’ poems.”

**A poem for two voices**

A poem for two voices involves lines read back and forth and often in unison between the two poets. It works particularly well when the voices represent similarities or differences or harmony or discord (Poetry in Voice 2023). According to research by Frazier and Murray (2009), poems with two voices can mimic the nature of science, with an emphasis on asking questions and seeking answers through close observation. They also used poetry to assess students’ understanding of scientific vocabulary.

Some examples of science topics that could be used with a poem for two voices are predator and prey, the Moon and Earth, or geographic isolation. When writing a poem in a content area, it helps to first generate a list of vocabulary or concepts independently, then for partners to compare and adjust their lists and collaborate in the writing. For example, during an ecology unit in which students learned about symbiotic relationships, they partnered with someone to show either mutualism, commensalism, parasitism, or competition. In the class lesson, they learned various examples of each type of

**FIGURE 3:** Two student poems, the second poem starting where the first poem ends.

**Ordovician Period Poem**

The roaring sea still washes over the Earth.

The trilobites’ rule has ended,
now cephalopods have taken over their rule.

Marine life has reached a high point in its rule.

No life has yet to set foot on land,
but some grasp onto rocks.

Plants suddenly start to sprout and blossom upon land.

You could just barely see over the horizon
the beginning of a mass extinction.

**Ordovician–Silurian Mass Extinction**

A Mass extinction
quiet the planet.

Brrrr …

It’s not just quiet, it’s cold.

This is the first of “The Big Five”

85% of life
is gone.

Lifeless. Dead. Extinct.

More than just a cooling climate.

It’s a sudden ice age!

Only the best adapted survive.

The Ordovician period ends
and the Silurian period begins

The world has changed and

Only 15% of species
live on.
symbiosis and chose one to represent in a poem.

Listening to each pair’s poems was engaging for the class, and this two-day activity allowed students to better understand and apply the concept of symbiosis, as well as work on their speaking and listening skills. If students need models for poems for two voices, the book Joyful Noise: Poems for Two Voices by Paul Fleischman (1988) is a collection of poems for two voices about insects. It can be helpful to hear some examples of poems for two voices and see writing strategies used to give students inspiration for how to approach their own poem.

The concise language of poetry allows for a quick way to gather formative or summative data on student comprehension. If students show misconceptions or not enough details to explain a concept, poems allow an opportunity for reteaching. For example, in one Earth’s history poem, a student misused the word invertebrates. While working with her I realized she thought invertebrates meant the vertebrae were inside the animal. With a little reteaching on the meaning of the prefix in meaning not, such as incomplete or independent, and then providing organism examples, such as a squid and a butterfly, she understood the concept of invertebrates.

As Dawkins (2016) said, “science is the poetry of reality”; however, teachers can also use poetry to embrace the reality of science. Poetry allows teachers to gauge student comprehension through a form of creative writing that celebrates students’ individuality. When poetry is collaborative, it adds another dimension of cultivating classroom community through teamwork and an opportunity for students to learn from and with one another.

REFERENCES

SUPPLEMENTAL MATERIALS
Earth’s history group poem activity—https://tinyurl.com/3uz4m685
Forms of poetry and examples—https://tinyurl.com/4bcw46e4

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