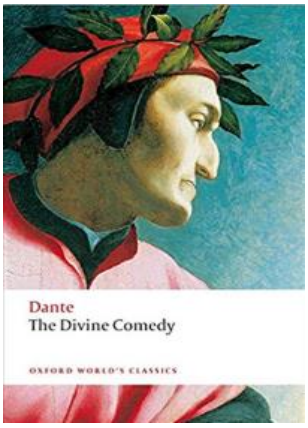
Teaching Science through Poetry

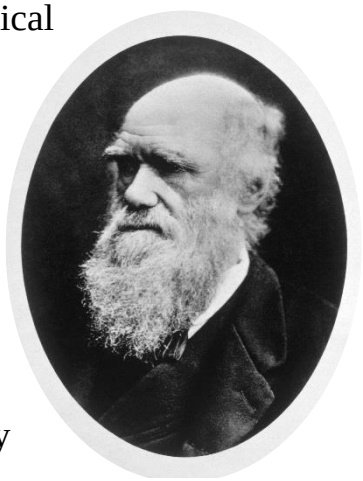
~ Sujata C

Poetry and science may sound like an odd couple, but they have had a surprisingly long and enduring relationship. Science is a subject that gets our left brain ticking. It is systematic, logical, linear, analytical and predictable, whereas poetry is considered to be about imagination, intuition, and abstract and subjective thoughts which get going in the right brain. But what they both deal with are wonder, awe and sheer genius. Both are capable of giving one goosebumps or making them feel sublime.

So, teaching science through poems is a concept where intellect meets intuition, and the marriage of the objective and the subjective takes place. But this is not a 21st century pedagogy. If one thought this to be so, let them read the history of the complex, yet beautiful relationship between science and poetry.

How science and poetry are linked since the early days of civilization: It is a well-known fact that many of the ancient Indian treatises were written in the form of verse. Poetry was used mainly because it aids in the retention of memory, and since the oral teaching method was practised in our country during the Vedic period, it was considered practical to use poetry. *Charaka Samhita*, the encyclopaedia of Ayurvedic Science contains 9,295 sutras and 12,000 slokas to cover all aspects of the medical science. *The Aryabhatiya* written by Aryabhata contains 123 stanzas and captures the essence of astronomical knowledge. *Brahmasphutasiddhanta* is the work of the mathematical genius, Brahmagupta. It is written completely in the form of poetry and without any mathematical notations, and even explains the quadratic formula in verse. In the West, we have Dante's *Divine Comedy* which is primarily a religious poem but also covers scientific concepts such as gravity and the movements of the sun and the stars. In the last few centuries, the works of many poets have been influenced by the science of their age. Robert Frost (1874-1963) was a farmer, an amateur astronomer and a teacher. Many of his poems posed fundamental scientific queries and observations. Emily Dickinson (1830-1886) was a sharp-sighted observer of nature. Her fascination for plants and herbariums was legendary as she saw the Creator's hand at work in nature. More than 200 poems of hers have scientific themes ranging from physics, chemistry, geology, physiology, astronomy and applied science. John Keats (1795-1821), a trained surgeon, quit his medical career in order to give more time to writing poems. Ruth Padel (Born: 1946) is a descendent of Charles Darwin and an acclaimed British contemporary poet who has dedicated a good part of her work to science.





Charles Darwin

Why teaching science through poems is being considered: Now let us look at the factors for which poetry can be used to teach scientific concepts effectively.

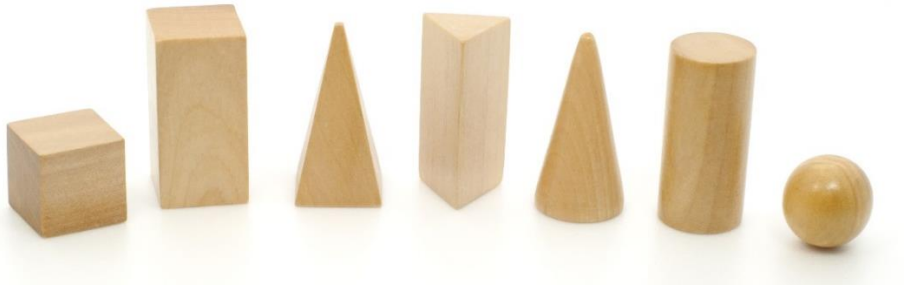
- **Need for simplicity:** The theories of science are complex and heavy with information, which make them difficult to memorise and understand. It

needs an intervention to make the concepts simpler with real-life examples. Here is where poetry can be used by science teachers as an effective instructional tool. For any meaningful learning to take place, *assimilation of information* and *reflection* are the key factors. In this regards, a well-crafted poem can help in better understanding and retention of information. For example, there is a famous nursery rhyme to teach numbers 1-10 to young children.

One, two,
Buckle my shoe;
Three, four,
Knock at the door;
Five, six,
Pick up the sticks;
Seven, eight,
Lay them straight;
Nine, ten,
A big fat hen …

- **The way poetry influences the brain:** Inquiry-based learning of science will stand its ground but a literature-based approach to teaching science can make it more impactful. Recent research by the University of Exeter has shown that poetry stimulates certain parts of the brain which trigger introspection and memory. This kind of activation increases the capacity of the brain to perform at a higher level, according to the research. Neurological studies also reflect that poetry works upon the mind in the same way as music. It encourages the use of imagination, and thus results in a deeper understanding of concepts.

- **Science is full of poetry:** As a poet takes pride in discovering the truth about self and the universe, and expressing them in verse, scientists too aim to find out the truth about their area of interest. The joy of invention is felt by both; where one develops new gadgets and the other creates new poetic forms. An astronaut can hear the heartbeat of a spaceship, and a mathematician can connect different geometric shapes with the relationship we share with people around us. Poetry can effectively communicate the agony and ecstasy of such experiences.



Geometric shapes

- **It will benefit students of different academic orientations:** Some students don't like science because they find the concepts difficult to understand as they are explained. However, students are bound to fall in love with poetry, if it is introduced to them in a proper way. Poems can be used as a medium to make scientific concepts more lucid with real life examples. The following poem by Christina Rossetti can be considered as an example.

  Who Has Seen the Wind?

  Who has seen the wind?
  Neither I nor you:
  But when the leaves hang trembling,
  The wind is passing through.

  Who has seen the wind?
  Neither you nor I:
  But when the trees bow down their heads,
  The wind is passing by.

Passing of wind

Here the poet has summarized the basic properties of wind which can help students visualize the concept described. It can become a part of lifelong learning, instead of rote learning.

Conclusion: It is clear that sparks fly in the classroom when science and poetry meet. Their chemistry is great and love for each other seems undying. That is why, in an ideal academic set up, teaching science through poetry should be a welcome

move because, unlike traditional science classes, it would make the lessons much more fun and entertaining.

Sujata C is a writer and editor with more than thirty years of experience. She writes on children, environment, society as well as technology. She has also been a copywriter with an advertising agency for almost fifteen years.

Lesson Plan: Teaching Science through Poetry

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Make the students familiar with the following:

- **Types of poetry:** Sonnet, limerick, haiku, couplet, free verse, epic, narrative, etc. with suitable examples
- **Tools of a poet:** Figures of speech, like simile, metaphors, onomatopoeia, assonance, alliteration, etc., and the patterns of rhythm and sound used in poetry, commonly known as prosody

After students have a basic idea about poetry as a literary type, the following can be done to get things going:

Initiate a discussion: Encourage students to reflect on how a poet would look at different concepts of science such as water cycle, life cycle of a butterfly, etc.

Water Cycle

Encourage reading: Recommed poems of Emily Dickinson, Robert Frost, Lewis Carroll, John Keats, William Wordsworth and all the other relevant poets whose works reflect concepts from science. Here is a curated list of poets and their poems:

1. Elizabeth Alexander: ***The Venus Hottentot***
2. Tracy K. Smith: ***Life on Mars***
3. Adrianne Rich: ***Power***
4. Diane Ackerman: ***We Are Listening***
5. John Updike: ***Cosmic Gall***

6. Jane Hirshfield: ***On the Fifth Day***
7. Oliver Sacks: ***The Man who Mistook his Wife for a Hat and Other Clinical Tales***
8. Edna St Vincent Mallay: ***Euclid Alone has Looked on Beauty Bare***
9. Campbell McGrath: ***Jane Goodall 1961***
10. Cosmologist and astrophysicist Janna Levis: ***Black Hole Blues and Other Songs from Outer Space***
11. Anne Leahy: ***The Habits of Light***
12. Wislawa Szymborska: ***Pi***
13. Neil Gaiman: ***The Mushroom Hunters***

Give writing tasks: Concepts from science can be understood better through poems based on themes, or written in acrostic and diamante pattern. Give students suitable examples and ask them to produce their own.

Arrange a nature walk: Find a suitable place near school, and ask students to go there and experience the sights, sounds, smells, and textures of nature. After they return, guide them to express their experience in poetic form.

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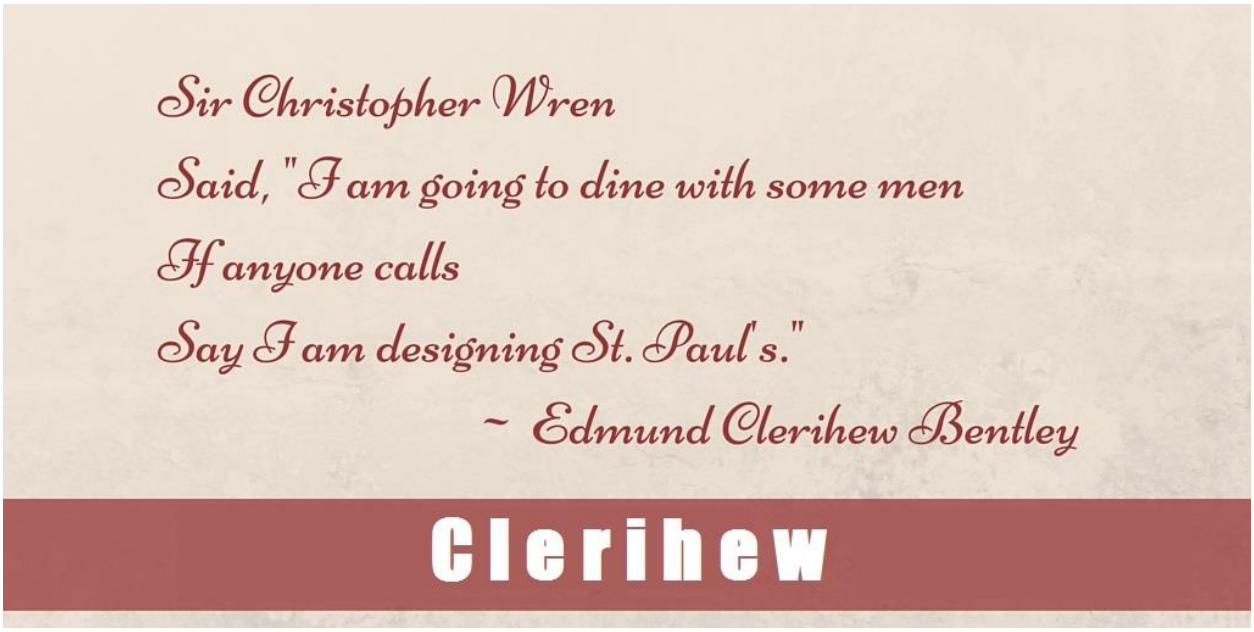
Clerihew (noun)



Pronunciation: /ˈklɛrɪhjuː/

Meaning: A short comic or nonsensical verse, typically in two rhyming couplets with lines of unequal length and referring to a famous person

Origin and additional information: The word came into English diction in the 1920s, and was named after Edmund Clerihew Bentley (1875-1956), English journalist and novelist, who invented the verse form. The Clerihew family name was found in the USA, the UK, Canada, and Scotland between 1840 and 1920.

Word section: The clerihew consists of a four-line stanza of two rhyming couplets. The first line is the name of the poem's subject, usually a famous person put in an absurd light, or revealing something unknown or spurious about them. The rhyme scheme is AABB, and the rhymes are often forced. The length of line and metre are irregular. Bentley's first published clerihew (1905) was about Sir Humphry Davy.

Sir Humphry Davy
Abominated gravy.
He lived in the odium
Of having discovered sodium.

This was written when Bentley was just 16 years old. The lines came into his head during a science class. Then with the help of his classmates, he filled a notebook

with many more such poems. The first use of the term, *clerihew*, in print happened in 1928. During his lifetime, Bentley published three volumes of his own clerihews – ***Biography for Beginners*** (1905), ***More Biography*** (1929) and ***Baseless Biography*** (1939). As the form grew popular, later authors like W. H. Auden and contemporary writers such as satirist Christ Brown have made considerable use of clerihew in their writings.

Usage: The clerihew form has also occasionally been used for non-biographical verses. Bentley opened his ***Biography for Beginners*** (1905) with an example, entitled *Introductory Remarks*, on the theme of biography itself.

The Art of Biography
Is different from Geography.
Geography is about Maps,
But Biography is about Chaps.

The third edition of this book (published in 1925) included a *Preface to the New Edition* in eleven stanzas, each in clerihew form. One stanza was as follows:

On biographic style
(Formerly so vile)
The book has had an effect
Greater than I could reasonably expect.

The form is extremely popular among the writers in the social media platforms, and currently July 10, the birthday of Edmund Clerihew Bentley is celebrated as *Clerihew Day*.

Contents sourced majorly from Oxford Advanced Learner's Dictionary.