

Atomic Structure – Students driving their learning

SAMACHEER, CLASS XI, SCIENCE, LESSON - 4

What is matter made up of? This is a question human beings have been trying to answer since a very long time. Our current understanding of the atomic structure is almost there but not perfect yet, research is still on. It is therefore important that children understand the significance of this concept and not see it as a dry boring topic. Before discussing the structure of an atom, I wanted to know whether my students knew the basic concept of an atom. Children, however were only able to answer that atom is 'anu' and not describe it any further. I realized that they were just translating the word and did not know much about the atom. Therefore, I gave them a simple assignment. They had to interact with their juniors and seniors, find out about atoms and come back and present it in the class. They were given two days for this.

When we reconvened, students' responses were very different. They were up with answers and ready with more questions.

- They had found out that atoms are the fundamental unit of matter.
- It has charged particles such as protons and electrons.
- There is attraction and repulsion inside the atom etc...
- As far as where they are found, students shared that atoms are seen in trees, in water and even in textbooks.

They were partially able to explain that atoms are everywhere. However, I had to clarify that atoms are not visible to the naked eye, as it is the smallest particle of any substance.

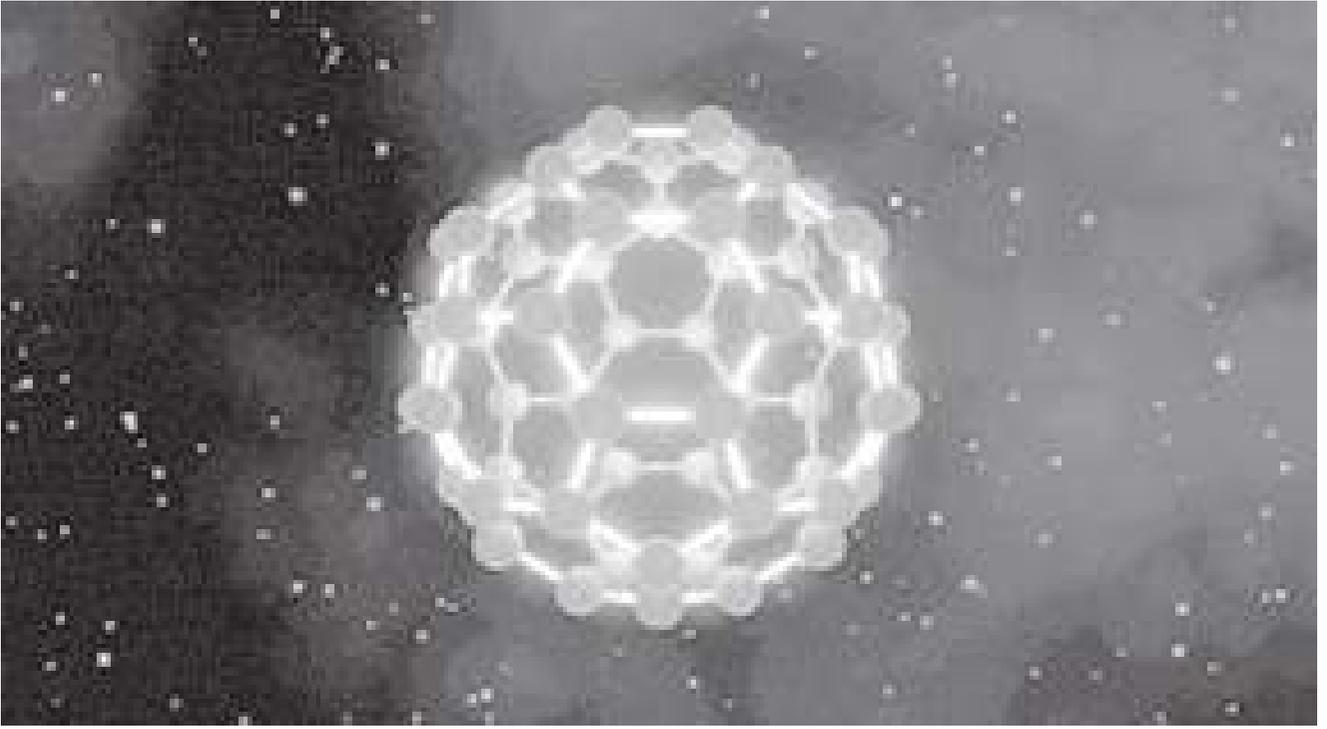
Since they now knew about atoms, their minds had started working. They had questions on this topic.

- What is the shape of the atom?
- Why don't electrons fall inside the nucleus of the atoms?
- How do electrons revolve around the nucleus?
- How were atoms formed?

We therefore had to have a discussion that cut across different disciplines. We discussed the Big Bang Theory and referred to the planetary model to explain the electron cloud orbitals. We discussed that cell is the fundamental unit of a living organism because it has life; it can reproduce, regenerate etc. Atoms are, however, the fundamental particle in all matter.

Atoms → Molecules → Organelles → Cells → Tissues → Organs → Organ systems → Living beings

I felt that this discussion was critical before moving on to the higher concepts about atom. We then continued the discussion on electrons,



protons, neutrons, mass number, atomic number, isotopes, etc.

Students' involvement was high though the concept was abstract. Their questions and enthusiasm pushed me to develop a deeper

understanding of this topic. It took us beyond the textbook to other subjects such as Biology and Social Sciences too. I realized that the nature of the class is vibrant when children take responsibility for their learning.



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