



# Science: Nothing But Atoms

## What if a lesson on atoms could put science in a broader perspective?

Alex taught science in a high school, and was concerned about two things:

- a) that students might take a scientific understanding of life and use it in a reductionist way; for example, "People are nothing but atoms."
- b) that students saw science as concrete, precise, and straightforward, but saw faith as vague.

Alex decided to teach about atoms in a way that undermined reductionism and showed that science has its own mysteries that can be hard to pin down.

"I started with the question, 'What does an atom look like?' Then I asked the class to think about this and sketch the picture that was in their mind. They explained their drawings to each other in pairs. I then divided the class into groups and gave each group a handout containing a brief explanation of how atoms were thought of by the following scientists:

Democritus

John Dalton (1766-1844)

Sir John Joseph Thompson (1856-1940)

Ernest Rutherford (1871-1937)

Niels Bohr (1885-1962)

Prince Louis de Broglie (1892-1987)

James Chadwick (1891-1974)

"Each group also had some modeling clay. Their assignment was to produce a two-minute presentation for the rest of the class on how atoms were thought about by their scientist, using the clay to illustrate this. The groups had to say what, if anything, they found challenging about their assignment. The groups working with the 20th-century scientists had the most difficulty because they struggled to describe and make a model of something that was so abstract. We talked about how we can describe life in terms of 'atoms' and 'quark,' and I showed some slides with headings:

- Van Gogh painting: nothing but an arrangement of atoms

- Soccer player scoring a goal: just atoms in motion
- Girlfriend/boyfriend: just quarks getting together
- Thoughts in my head: just electrons buzzing around

“Each of these statements is true at one level, but is it enough? I asked the students each to make up five more ‘nothing-but’ statements, each ending with ‘atoms, electrons, or quarks.’ I explained that this is called reductionism (or nothing-but-ery) and involves ignoring or explaining away other levels of explanation. I then asked them what important things were missing from these statements. Does the Van Gogh statement really tell us about the painting, for instance? Does it respect what people are, to describe them as ‘nothing but’ atoms? For homework, I asked students to write ten lines in response to the following question: ‘Nothing but’ — how do I feel about this?”

## What's going on here?

Alex saw his lesson as a chance to show that a reductionist approach is not an adequate explanation of life. A physical description on its own is not enough; life is so much more.

Alex engaged students in exploring contrasts and dissonance (contrasting models, slides with headings) and experiencing a creative and tactile task that led to comparisons.

He reshaped his practice by choosing examples and activities that challenged how students thought about science, by including tasks in which students ran into limits, and by raising big questions about science and faith.

## What does this have to do with faith, hope, and love?

This exercise is designed to help students see that the reduction of all human experience to a materialistic explanation destroys what it means to be human, and misses out on other needed explanations. Christian faith paints a richer picture of people and of the world. Far from being “nothing but” atoms, we are created persons with amazing abilities including the ability to create, love, and make moral choices. The reductionist explanation is like a circle in relationship to a sphere, pointing to something valid but lacking depth.

## What difference does it make?

Science is always assumed to be more concrete than religion, and there is a certain security in being able to describe something in terms of its physical properties (atoms, quarks, etc.). Alex raised the students' awareness that scientific explanations have become increasingly abstract through history, and have forced us to wrestle with things we cannot easily represent. To reduce things to just physical properties trivializes life.

## Where do we go from here?

In addition to learning about how atoms are described, teachers could consider various ways the science of atoms have been used, and which are consistent with faith, hope, and love. Teachers could use scientists with different world views to highlight that science is not a neutral activity.

## Digging deeper

The Bible does not describe people only in physical terms, nor does it define people only in spiritual terms. Human beings are hybrid creatures. The Bible sometimes refers to people as "body and soul" or "body, soul, and spirit," with soul and spirit including the will, emotions, and thoughts, and our relationship to God ([1 Thessalonians 5:23](#), [Psalm 31:9](#)). The Bible is not precise in its terms; "soul" can stand for the whole human being and take on the meaning "person," or it can stand for a part of our make-up ([Genesis 2:7](#)).

People are not like hand puppets, with the soul inside the body. The two are intricately connected and affect each other. They describe different facets of what we are as whole people. Worship involves the whole person, as do most activities. The body can be spiritual; it is not less than the soul. The Bible talks of people having a new body after death ([1 Corinthians 15:42-44](#)). Far from being abstract, biblical spirituality is down to earth and physical.

The human spirit makes us aware of a spiritual dimension of life and helps us to connect with God, but it too is intricately connected with our bodies and minds. Any attempt to define human beings by just one aspect—be it spiritual or physical—misses out on the complexity of the way in which we are made.



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