

The Advantages of Using LEGO® Bricks as Atom Models

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When introducing middle school students to chemistry, employing bricks to represent atoms as shown in the **LEGO Atoms and Molecules Set** is a great idea for many reasons, pedagogical and practical.

The pedagogical reasons will be highlighted first. Overall, chemistry concepts are well conveyed by the LEGO bricks:

- **LEGO bricks visualize a favorite teaching analogy.** Texts often refer to elements/atoms as the building blocks of nature.
- **LEGO bricks clearly demonstrate different elements.** Each color brick represents a different atom. Unlike working with random candy gumdrops, students become familiar with the standard chemical colors, black for carbon, red for oxygen, etc. Most of the atom bricks are of the standard 2X4 size, however hydrogen is modeled by the smaller, white 1X2 brick.
- **LEGO bricks avoid confusing representations of chemical bonds.** Atoms cling together to make compounds. Students naturally create compounds by attaching bricks together. With LEGO bricks, chemical bonds do not need to be physically represented by small sticks. At the middle school introductory level the first chemistry concepts (such the definitions of elements, compounds, mixtures, and chemical change) the details about single bonds and double bonds are unnecessary.
- **LEGO bricks emphasize the importance of molecular shape.** LEGO atoms emphasize that molecules take specific, functional shapes. Although the exact chemical bond angles cannot be duplicated with the bricks, LEGO molecules are built to exacting shapes.

Practically speaking, LEGO bricks simplify materials management in the classroom. LEGO Atoms and Molecule Sets are long-lived products without smaller components that break or get lost. Furthermore, LEGO bricks can be easily replaced from local stores, unlike components of other molecular models. LEGO bricks are inexpensive-- they cost very little when purchased in bulk quantities. Lastly LEGO kits are very motivational. Students are eager to work with the LEGO bricks--- so much so that teachers will need to plan ahead in their lesson plan. When teachers need the students' undivided attention, the bricks should be returned to the box. It is hard to compete with LEGO bricks!

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