

The Atom Board



Made from renewable sources, in an eco-friendly manner.



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The New Atom Board

Imagination ... It's what makes us different



Why Teach with the Bohr Model?

We designed the atom board based on the Bohr Model. So why did we chose the Bohr Model if its not the most recent conception of the atom?

The "real" model is very complicated and abstract for middle school students, and even some high school students. Bohr's model may not explain current atom theories, but it still provides a basic understanding of atoms and how electrons behave. Furthermore, it is probably the easiest model out there that helps students understand the "quantum hypothesis."

Many middle and high school teachers today, continue to teach chemistry using the Bohr's model, with the caveat that it is not the current model. It is a terrific opportunity to talk about how science evolves and models change. The Bohr model makes things more concrete and definite for kids. Moving from concrete to abstract is the natural pathway in teaching. As our students mature and understand more of the mathematics that lie behind the current atomic model, they will also gain a better appreciation for the current atomic model.

It's the teachers role to evaluate students, find their readiness level, and teach to that level. Teaching above what they can understand only serves to convince them they don't "get" science.

What are some teachers saying:

- It is tough to explain advance chemistry concepts to 6-8 grade children. I personally work with the Bohr model, because it helps students understand the “quantum hypothesis.” - Dr. Herringer, CA.
- If you are comfortable enough with the Schrodinger Model of the atom, with particle-wave duality, to teach it well, and if you think grades 6 -9 can handle such a conception of the atom then by all means do so. The atom board has allowed my students to gain the foundations they need in order to further research new ideas and concepts. - Richard, WV.
- It is not surprising that authors and teachers routinely use analogies when explaining science concepts to students. Analogies have always played an important role in scientific explanation, insight, and discovery. For example, Johannes Kepler, the eminent 17th-century astronomer, drew an analogy between planetary motion and clockwork. The Bohr model is an analogy that works for me and my students. The atom board has helped my students visualize this analogy. Harrison, WI.

A different way of looking at the Bohr Model

How do you show electron fields in a 2-D traditional model? Change your model to a 3-D.

The change to the board:

Atomic physics is one of the most demanding topics to be taught to students. The traditional introductory approach uses semi-classical descriptions such as the Bohr model in which the atom is likened to a planetary system with electrons orbiting the nucleus, analogous to planets orbiting the Sun. To reduce the difficult mathematical requirements (such as solving complex differential equations) introductory quantum mechanics courses usually present highly abstract, but at least visual, ideas such as the ‘square potential well’ and the ‘simple harmonic oscillator’ before atoms are described in a purely mathematical way.

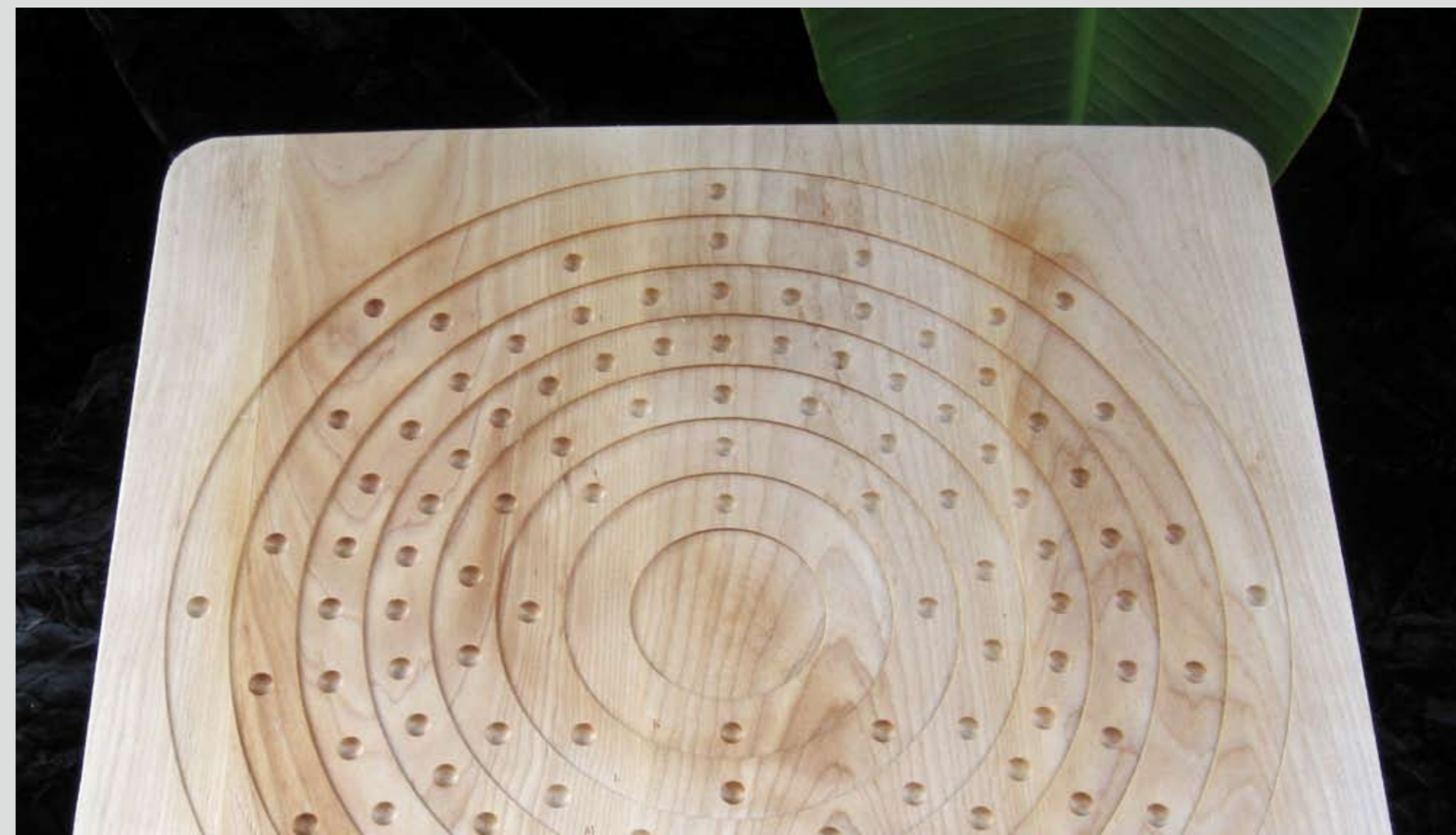
The problems traditionally encountered in studying the atomic structure are as follows:

- students find it very difficult to make connections between different complex ideas;
- content overload, making it difficult for students to identify the main concepts; and
- the abstract representations reduces students’ ability to link the theoretical description with physical observations.

The first atom board that we used was a two dimensional board, where in the strictest sense it portrayed the atomic structure as a planetary system. The new model adds a third dimension, electrons orbiting in energy clouds. It visually differentiates the electron clouds by placing them in different heights around the nucleus.

It’s a new approach to a traditional model, that will allow students to move on to more complex models as their understanding increases. In general, when teaching with models, it is important to follow the rules:

- Introduce target concept
- Cue retrieval of analog concept
- Identify relevant features of target and analog
- Map similarities
- Indicate where analogy breaks down
- Draw conclusions



Solid Wood

Solid wood construction is timeless. It’s an icon of absolute style and elegance.

Eco-Friendly

Our atom board is made from cultivated birch wood, a renewable source. It is sanded and finished with a clear coat that is water based for 0% toxicity.

The Model

The model is ideal for presenting to children who are interested in chemistry. It serves as an excellent introduction to other atom models.

Concepts

- Valence Shells
- Energy Fields
- Light
- Electron Sharing
- Polar Bonds
- ATP→ADP Concepts
- Stable Atoms
- Isotopes
- Ions