

## **The Trained Honey-Pail**

### **INTRODUCTION:**

This works really well as a "black-box" introduction to the various models of atomic structure.

### **CHEMICAL CONCEPTS:**

logical reasoning, scientific method, and use of models in science

### **MATERIALS:**

Find any round can with a removable lid. Solder the solid end of a safety pin to the centre of the can bottom and another to the centre of the can lid. Find a heavy weight such as a very large (2 or 3 cm) nut from a carriage bolt and tape it to the middle of one strand of a heavy elastic band. Open the pin on the can bottom and insert the end of the elastic in the pin. Close that pin.

Do the same with the pin on the lid. Push the lid back into place and prepare to "train your honey-pail" (or Paint can or whatever the label suggests).

### **PROCEDURE:**

"Stay" is usually easy to do!

My can always needed some help with "Sit".

"Heel" requires a bit of practice. Roll the can gently away from you. The weight should wind up the elastic, store the energy and the can will return to its original place if the floor is smooth. In fact, it will overshoot that spot and "follow you" for a half metre or so (depending on the weight and the strength of the elastic). Whistling and slapping your knee adds to the fun.

When students want to know how it works, tell them to observe its behavior and come up with a model that accounts for their observations. Since we can't see inside an atom, they can NEVER see inside your honey-pail! But, they are free to "train their own" and show the class their model.

### **DISCUSSION:**

The application to modeling atomic structure is obvious. Most often students will protest that we can't take atoms apart because they are too small. "So why can't we take the can apart?" I point out that many of their classmates are probably curious about what's inside a student, but we can't take them apart because we might damage a part or may have trouble putting them back together again... same thing with the Honey Pail!

In demonstration sessions with teachers, I point out that this is an excellent device to show students that they can take a subject seriously without taking themselves too seriously. (Do you know any teachers that haven't learned that lesson yet?)

### **ACKNOWLEDGMENT:**

I first saw this application of an old toy idea in one of Irwin Talesnick's classes in the College of Education at Queen's University. It has served me well for three decades... and beyond!

