CHAPTER 9

Intersemiosis in Science Textbooks

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Introduction

In education, the use of images is an absolute necessity. Explaining infinitely miniscule concepts such as quantum foam, complex and rapid phenomena like the cardiovascular system, or temporally distant creatures such as dinosaurs requires the use of images to effectively develop understanding in students who are being introduced to these ideas. In nearly every textbook, the visual medium is used to assist in introducing scientific concepts to learners through such media as diagrams and flowcharts, artistic renderings, and photographs (Libo, 2004).

Visual description allows for communication that is impossible with words alone. Without writing, ideas conveyed through images have a different impact. They have a symbiotic relationship, providing affordances for meaning making. The combined potential of seemingly disparate media, or intersemiosis, enables an author to explore an increased variety of communicative means to educate learners more effectively (Bednarek & Martin, 2010; Martin & Rose, 2008). To illustrate this concept of multimodal integration, the following photographs demonstrate how intersemiosis builds new meaning by incorporating multiple media. Figure 9.1 depicts a typical representation of an atom.

Figure 9.1 has what many of us understand to be an atom. As readers, we may reflect back on previous science classes, remembering that the rings are electron paths, recognize the tightly packed nucleus comprised of protons and neutrons, and even perhaps take note of the hazy background. But when given a specific context, as in Figure 9.2, the meaning of the photo is redefined through the text.

With the help of the text, the focus of the audience is redirected to a new interpretation of the atom, one that forces us to re-evaluate the image, and our scientific knowledge, and perhaps, makes us wonder what a probability
This outdated model of the atom does not reflect electron probability distribution.