

Abstract

This is the teacher's guide for the activity book of Matter and Molecules, a set of instructional materials about the kinetic molecular theory written at the middle school level. The complete Matter and Molecules materials include a science book, an activity book, 17 transparencies, three wall posters, and teacher's guides for both the science book (Occasional Paper No. 121) and activity book.

The Matter and Molecules materials were used in a research and curriculum development study during 1986-1988. The project staff studied grade 6 Students' prior knowledge of the aspects of the kinetic molecular theory. This information was then combined with teaching strategies identified in earlier studies to design instructional materials particularly effective in promoting meaningful conceptual change learning. Such learning requires students to go beyond the memorization of terms and to use scientific conceptions to explain common phenomena. For students, this kind of learning in science often requires them to go through the difficult process of conceptual change, reshaping and abandoning ideas or misconceptions that they have developed from experience and have believed for a long time.

The first year of the project, the Lansing grade six science teachers used Models of Matter, which is the third unit in the sixth-grade level of the Houghton Mifflin Science Program. The project staff conducted pre- and post-clinical interviews and tests and observed the classrooms of four collaborating teachers. Posttests only were given to the other grade six science classes. This data informed the development of the Matter and Molecules materials.

The second year repeated all segments of the first year except all teachers used the Matter and Molecules instead of the Models of Matter materials. The Matter and Molecules materials were found to be helpful to the teachers, and the students using these materials were more successful in undergoing conceptual change than students who used the Models of Matter materials.