This is the published version:


Available from Deakin Research Online:

http://hdl.handle.net/10536/DRO/DU:30019278

Reproduced with the kind permissions of the copyright owner.

Copyright: 2008, The Authors
An enormous amount of research in the conceptual change tradition has shown the difficulty of learning fundamental science concepts, yet conceptual change schemes have failed to convincingly demonstrate improvements in supporting significant student learning. Recent work in cognitive science has challenged this purely conceptual view of learning, emphasising the role of languages, and the importance of personal and contextual aspects of understanding science. The research described in this paper is designed around the notion that learning involves the recognition and development of students’ representational resources. In particular, we argue that difficulties with the concept of force are fundamentally representational in nature. The paper describes the planning and implementation of a classroom sequence in force that focuses on representations and their negotiation, and reports on the effectiveness of this perspective in guiding teaching and learning. Classroom sequences involving three teachers were videotaped using a combined focus on the teacher and groups of students. Video analysis software was used to code the variety of representations used, and sequences of representational negotiation. Stimulated recall interviews were conducted with teachers and students. The paper will report on the effect of this approach on teacher knowledge and pedagogy, and on student learning of force.