

BRIEF LEARNING CYCLE BACKGROUND

- People tend to approach experiences that lead to useful and enduring knowledge in similar ways.
- The Learning Cycle is an instructional design model developed to organize educational experiences to be consistent with what is known about how people learn.
- It has roots in learning theory that was developed in the early 1900s, reflected in the work of Dewey, Vygotsky, Montessori, Piaget, and others.
- It was formalized into the Learning Cycle by education researchers and scientists (Atkin, J.M. & Karplus, R. 1962) who conducted a comparison study of Learning Cycle and non-learning cycle-based instruction that found learning cycle-based instruction to be more effective. It has been said of Robert Karplus: "His work in science education was driven by his fascination with the responses of children to nature. He enjoyed the act of discovery and wanted science curricula to make that joy available to others." (Fuller, 2003)
- The Learning Cycle is supported by ongoing research. It has been transformed and deepened through educational and cognitive scientist research.
- Research has found that a Learning Cycle approach can result in greater achievement in science, better retention of concepts, improved attitudes toward science and science learning, and improved reasoning ability and process skills than traditional instructional approaches (see for example: Abraham & Renner, 1986; Chi, 2008; Duran, et al., 20011; Ivins, 1986; McComas III, 1992; Raghubir, 1979; Renner, Abraham & Birnie, 1985).
- The Learning Cycle has now gained wide acceptance as a useful way to design educational experiences based on how people learn. It has been expanded and utilized in other fields. Many different educators and researchers have designed different Learning Cycles, with various names, descriptions and phases, like the 5 E's, Flow Learning, Coyote Mentoring Natural Cycle, or Experiential Learning. Some of these just have different terms for phases, and others have different intentions behind phases, but at the core, are all influenced by similar research/observations.
- The terms and phases in the Learning Cycle used by BEETLES, and other Lawrence Hall of Science programs, were chosen to reflect current research. The book *How People Learn: Brain, Mind, Experience, and School* is an important summation as of the dawn of the 21st century, even as new brain science, educational research, and the ubiquitous presence of technology in so many aspects of life and education continue to break new ground. A free PDF of *How People Learn* is available online from the National Academies Press at <http://www.nap.edu/catalog/9853.html>

The Learning Cycle we present is one model that can be used to represent phases that support learning. It's of course not the only way! Nor should not be seen as a rigid or mechanical model—people and their learning processes are gloriously complex, and there is no automatic order or sequence in which these phases must take place. That said, a learning cycle approach has been shown to be a solid pedagogical foundation in designing meaningful and effective learning experiences.

