

Instructional Approaches

A number of instructional approaches have built upon the work of Piaget and other researchers. One of the most widely used of these approaches is called the Learning Cycle. There are variations to the steps of the Learning Cycle, but one version consists of these steps:

- **Engaging with a concept:** This is the “grabber” step of the Learning Cycle where you can capture children’s interest about a topic. This can happen with a demonstration, video, interesting samples, cartoon, story, going outdoors, or many other methods. It is important in this step to link the concept to the children’s experiences and knowledge base.
- **Exploring a concept:** One of the best ways of having children explore ideas is by hands-on experiences. If you are teaching about Earth history during your visit, for example, get samples of fossils into the children’s hands as soon as you can. Get them started on asking questions about the fossil samples and looking for patterns and relationships between them.
- **Explaining a concept:** After the children have time to explore, your explanation can help them to focus on the key concepts you want them to understand. This is a good time to let the children ask questions of you and each other, and seek for explanations together.
- **Applying a concept to a new situation:** So that you feel confident that the children you are working with “get it”, give them an opportunity to apply their knowledge to a new situation. For example, if you are having them learn to identify a set of minerals, give them a couple of new samples to try identifying later in the lesson.
- **Expanding a concept:** This is a “what next” stage. Children think about other questions on the concept they could investigate. This helps them to expand their understanding of the concept. Classroom teachers often use free-standing Learning Centers to enable interested children to explore these “what next” questions.

During a relatively brief classroom visit (45 minutes or so), you may only get to the Explanation Stage of the Learning Cycle. The classroom teacher can then follow up with the later stages. If possible, provide him or her with activities that help children make those “next steps” after your visit. It is important to remember that the steps of the Learning Cycle put into clear and simple language what are really a series of complex intellectual processes for both children and their teachers.

The Learning Cycle is just one research-based approach used in science teaching. The lessons in the activities section use a modified Learning Cycle approach to help students learn science through inquiry. The inquiry aspect of the lessons is based upon the body of research which supports the definition of **inquiry** in the *National Science Education Standards* and in the *Benchmarks for Science Literacy*. Students who learn science through inquiry may begin with their own question to investigate, or someone else's question, but, eventually they need to find answers that:

- Fit with their existing understanding and developmental level
- Make sense
- Are scientifically correct (even if only at a very simple level)
- Help them to understand their world
- Lead to new questions

Note that inquiry is more than just hands-on; good inquiry is “hands-on, minds-on”. As a visiting instructional leader, you can both promote and guide the discovery and inquiry process. Rather than answer student questions directly, you can help them find their own answers, which again helps them experience the scientific process.

While hands-on, minds-on experiences are a vital part of the inquiry method, children also need to draw upon the information they can find in books, videos, the Internet, CD-ROMs, magazines, field trips, experts (including you and their teacher), and each other. You can work with the classroom teacher to craft or select experiences for children that allow them to investigate science questions in a rich and supportive atmosphere. This includes giving children time to explore science; as well as giving them access to information technology; interesting items to investigate; opportunities to discuss and share; and the chance to investigate their own questions.
