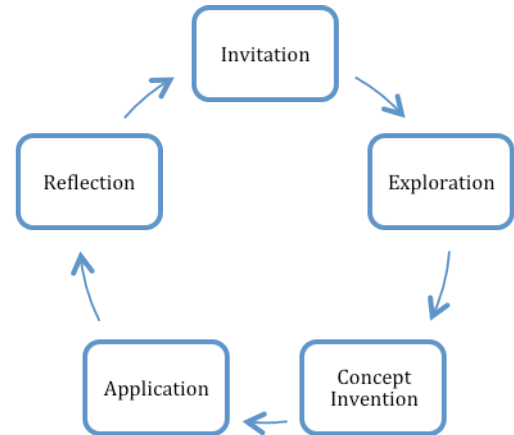# The Learning Cycle

Invitation

The learner becomes engaged in the topic and accesses relevant prior knowledge. Without engagement, learning tends to be rote, and less likely to be retained. Accessing prior knowledge sets context, and facilitates the learner making connections to what they already know.

Instructor's Role:
- *Set the stage for learning, set context, create interest, curiosity, focus and anticipation about topic to be explored*
- *Offer a question, a challenge, an observation, or a hands on experience to generate curiosity about exploring the topic*
- *Encourage inquiry mind-set and abilities – inspiring learners to make observations, ask questions, and construct explanations.*
- *Encourage learners to discuss connections with prior knowledge and experiences*
- *Listen to student ideas on the topic to uncover and try to understand their current knowledge*

Exploration

With independence from the instructor, learners engage in open-ended exploration of phenomena, and/or ideas. Exploration generates curiosity and questions, as well as a struggle with making sense of things. Exploration also provides a common base of experiences for learners to develop new concepts, skills and practices.
Instructor's Role:
- *Encourage learners to work together independently of direct instruction from the instructor.*
- *Provide only as much instruction and information as necessary to set learners up for independent exploration.*
- *Observe and listen to learners as they interact.*
- *Ask probing questions to redirect learners' investigations when necessary.*
- *Provide time for learners to puzzle through questions.*
- *Be an enthusiastic and curious co-investigator.*
- *Act as a consultant and facilitator for learners.*

THE LAWRENCE
HALL OF SCIENCE

Concept Invention

After interest and attention is focused through invitation and exploration, learners make connections and construct new meanings from experiences, often facilitated by an instructor. Ideally, this is largely student-generated, but if you have specific content you want them to know, this is the time to deliver it. But it's key to understand that no matter what is "delivered" to them, learners actively generate ideas and concepts, and make sense of them for themselves. Each learner takes information and fits it into his/her own conceptual frameworks, and the concepts they walk away with are unique to each individual.

Instructor's Role:
- *Encourage learners to explain concepts, definitions, and science practices in their own words.*
- *Ask for evidence, results and clarification from learners, to help guide them to making sense of their experience.*
- *Provide formal definitions, explanations, and new vocabulary, as necessary, to explain concepts.*
- *Use learners' direct experiences as the basis for explaining concepts.*

Application

To truly learn something, the learner needs to apply new concepts and ideas to a different context. Learners apply new knowledge, vocabulary and skills to solving a problem or meeting a challenge in a new situation, through activity, or through discussion. Learners gain deeper and broader understanding, gather more information, make connections to real world problems, and develop transferable skills.

Instructor's Role:
- *Provide opportunities for learners to apply vocabulary, definitions, skills and explanations to new situations or problems.*
- *Evaluate student progress and understanding and provide feedback.*

Reflection

Learners reflect on their learning, compare new ideas to alternative explanations and extend thinking. Through discussion, quiet thinking, writing, and/or drawing, they make connections and construct new conceptual frameworks. They examine and analyze how they arrived at their current understanding to help them understand how they learned what they learned.

Instructor's Role:
- *Prompt learners to reflect on activities to help them confront their former ideas and evolve new ones.*
- *Prompt learners to solidify conceptual framework connections*
- *Prompt learners to help build metacognitive (thinking about your own learning) skills*

THE LAWRENCE HALL OF SCIENCE