

To the Teacher

Process-oriented guided-inquiry learning (POGIL) is both a *philosophy* of teaching and learning and a *strategy* for teaching and learning. It is a philosophy because it encompasses specific ideas about the nature of the learning process and the expected outcomes. It is a strategy because it provides a specific structure for teaching that is consistent with the way people learn and leads to the desired outcomes.

The goal of POGIL is to engage students in the learning process and help them master the material through conceptual understanding while developing essential learning skills rather than by memorizing and pattern matching. Important skill areas for success in chemistry courses, college, and careers are information processing, critical and analytical thinking, problem solving, oral and written communication, teamwork, and metacognition. Metacognition literally means "thinking about thinking." It includes reflecting on what has been learned and remains to be learned, self-assessing performance to identify strengths and areas for improvement in order to improve future performance, and taking charge of and responsibility for one's own learning and success.

POGIL activities utilize a learning cycle design of exploration and concept formation followed by application. Each activity begins with an *orientation* that sets the stage for learning. The importance of the activity is described in a *Why?* statement. *Learning objectives* and *success criteria* are identified along with prerequisite activities and knowledge. The learning objectives describe what the student is expected to learn. The success criteria specify the measurable outcomes of the activity, i.e. what the learner should be able to do at the end. It is quick and easy to make up examination questions simply by looking at the success criteria for each activity.

Students then explore a *model* in response to *key questions*. The model is any representation of what is to be learned. Key questions unlock the information present in the model and reveal its significance. They guide the learner to discover the relevant concepts and develop an understanding of the concepts. *Information* is provided at the beginning and throughout an activity, but only when a *need-to-know* has been created.

The new knowledge then is applied in simple exercises that build confidence, and to higher level applications that require synthesis of ideas, transfer to new contexts, and problem-solving skills.

While individual students can complete an activity, the activities are most effective when used by students working in learning teams of three or four students with the teacher acting as a coach, guide, or facilitator.

Many resources are available to help instructors teach in this new student-centered environment. They can be found at the Pacific Crest and POGIL web sites (www.pcrest.com and www.pogil.org). Both Pacific Crest and the NSF-supported POGIL Project sponsor workshops for faculty to introduce process-oriented guided inquiry learning and to assist faculty in developing facilitation skills and obtaining materials for use in their classes. Workshop schedules are posted on the web sites.