Phosphorus (P) is a required element for life; consequently, its availability may impact primary production rates as well as species distributions and ecosystem function. As an essential plant nutrient, phosphorus is predominantly used as a constituent of fertilizers for agriculture. Phosphorus is also used as a precursor for various chemicals used as flame retardants, pesticides, extraction agents, and water treatment. It is an important component in steel production, utilized in the making of special glasses and fine china, a component in some laundry detergents, baking powder, matchbook strikers, flares, and for military use in incendiary bombs and grenades. Much of the P from fertilizer and animal waste and from other anthropogenic sources enters surface waters and groundwater and these nutrient loads can stimulate large scale macroalgal and/or phytoplankton blooms in receiving waters. Nutrient enrichment in aquatic systems can cause diverse problems such as harmful algal blooms, anoxia, fish kills, loss of habitat and biodiversity, and other problems. Thus, identifying and understanding nutrient inputs and their effects on aquatic ecosystems are of critical importance to management and restoration efforts. In particular, educating the general public about the role of P in our aquatic environment and how human activity impacts natural cycles (including that of P) has implications for the creation of literate and environmentally aware citizens.

Given the elemental nature of P, we have developed lesson plans and an activity kit (“Phosphorus in our Waters”) that can be used by educators to teach about water quality and nutrients in the environment. A three lesson unit has been prepared and includes all of the materials and instructions needed for teachers to lead a successful activity. These kits have been tested with great success by high school educators in the Santa Cruz vicinity. One kit now resides at UCSC/MBARI and the other at OSU. They are both available for distribution (Fig. 1). Given that P is an integrative research theme with investigators at each partner institute (Karl, Repeta, Dyhrman, Letelier, Zehr, Chisholm, and others), this P-centric activity has the potential to be adapted to the needs of many within and outside of the core C-MORE personnel.

![Figure 1. A subset of the components included in a single science kit: including a Vernier spectrophotometer, software, chemical reagents, pipettes and tubes for a standard curve. Along with laptops, one of these kits is at MBARI/UCSC and the other at OSU. Both are available for distribution to CMORE partner institutions and beyond.](image-url)