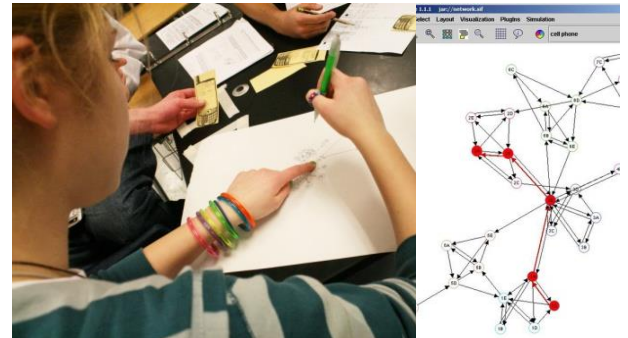


# Curriculum Supplement Series

## Ecological Networks

*This curriculum unit is divided into two modules. In the first module (Introduction to Systems), students in 6<sup>th</sup>-12<sup>th</sup> grade gain basic systems understanding and begin to develop the skills of systems thinking. In the second (Ecological Networks), students in biology, ecology, and STEM courses apply their understanding to a case study involving a mysterious water ecosystem that changes color. These 8 lessons may be taught separately or together as a two week unit.*

The Baliga Lab at the Institute for Systems Biology has been translating their research into user-friendly curriculum modules since 2004. Through forming collaborative teams comprised of scientists, educators, and students, today's research and methods have become hands-on, accessible activities for students. In 2007, the Ecological Networks module was certified by WA State LASER (Leadership and Assistance for Science Education Reform) as exemplary materials according to their rigorous guidelines.



**Introduction to Systems:** The development of systems concepts for students begins with a highly interactive inquiry into cell phone networks. Cell phones serve as a handy knowledge base on which to develop understanding. Students learn how to build a network and discover the power of using computers to build and analyze a graphical depiction of a network. They apply their network understanding to represent complex ecological systems. Students use Cytoscape to author a system of their choosing while considering a variety of interconnected abiotic and biotic factors. *(Two lessons taught over three, 50-minute class periods)*



**Ecological Networks:** Students are first introduced to extremophiles to better understand the broad range of life on our planet and to foster further conceptualization of the interdependence of a system. This leads to using networks to tackle a real world investigation. Students observe an environmental disturbance that has resulted from a man-made causeway across an unidentified body of water. After making observations and posing questions to the teacher, the students use evidence to design and test their hypothesis. After performing an experiment, they collaborate with other classes by pooling all data sets to complete a statistical analysis of their results. Comprehension is assessed when students go back to their original hypothesis and plan an experiment which is later peer evaluated. When completed, they revisit the new GSL network as a class and see how the experimental data is incorporated into and validates the most current network. *(Six lessons taught over seven, 50-minute class periods)*

