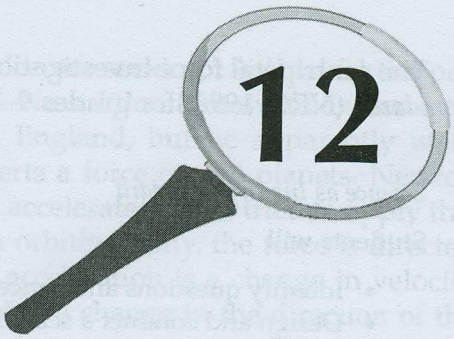

Teaching Physics Through Inquiry

MEASURING CENTRIPETAL FORCE

In this case study, we will follow George Wolfe, a veteran teacher of 28 years, as he leads his 9th-grade students through a lesson on calculating centripetal force. George teaches Advanced Placement biology and a college preparatory physics course at Wilson Magnet High School, a large, urban high school in Rochester, New York. The class in this case study contains 18 students in the school's International Baccalaureate program. In this school, 9th-grade students begin their high school science sequence with physics.

George Wolfe is a nationally acclaimed teacher. In 1990, he received the Outstanding Biology Teacher Award from the National Association of Biology Teachers, and in 1999, he received the prestigious Presidential Award for Excellence in Math and Science. In 2002, George was recognized by the Radio Shack National Science Teacher Award, and he was recently nominated to the National Teacher Hall of Fame. George has also developed the Nasonia Project, an inquiry-based genetics program produced by Ward's Natural Science, to study heredity using parasitic wasps (*Nasonia vitripennis*) as an alternative to fruit flies (*Drosophila sp.*). (For more information on the Nasonia Project, see www.wardsci.com. Click on "biology," then go to "biology lab activities," "genetics," and "Nasonia Project.") Recently, George Wolfe has become a lab developer for the Cornell Institute for Physics Teachers. In this lesson, George uses the classic, well-known demonstration of measuring centripetal force by spinning a rubber stopper attached to a string threaded through a thin glass tube (Liem, 1987; Murphy, 1982). Rather than following a traditional laboratory procedure, students will design their own experiments in determining the relationship between centripetal force and one other variable identified by the student groups (mass of the stopper, velocity of the orbiting stopper, or radius of the orbit).