Dear Parent/Guardian,

Through a special partnership with the University of Wisconsin-Milwaukee, your student is participating in a unique standards-based STEM program called the Wisconsin Inquiry-based Scientist-Teacher Education Partnership (WInSTEP) program, which is funded by the Science Education Partnership Awards (SEPA) program and is supported by the U.S. National Institutes of Health (NIH). This program provides science students with opportunities to conduct inquiry-based experiments that link biological concepts with environmental health issues, such as lead poisoning and the impact of toxic chemicals on neurodevelopment. During the school year, students study the effects of environmental toxicants on the development and behavior of model organisms, and then correlate the results obtained from these hands-on experiments to human health concerns. Students communicate the insights gathered from their research projects via the scientific process of writing research papers and creating posters. To develop students’ scientific communication skills, the year-long program culminates with an annual student research conference in which students share their research through presentations of their papers and posters.

The module your student will be participating in involves the use of fathead minnows. Fathead minnows are an important model for studying behavior and they help students understand connections of disease to humans and the potential impact the environment has on behavior. Through this module, students interact with living organisms, become engaged in open-inquiry, and understand that substances, such as lead, affect the reproductive behavior of minnows. Students then explore how that translates to human behavior. This type of hands-on interaction has a significant impact on student learning and scientific literacy. Students are able to see first-hand the impact lead has on behavior, which is a very powerful lesson to understanding lead poisoning in people. This allows students to relate science to the world outside of school, and to connect their research to their own lives and to the environment. Evaluations done on the WInSTEP program over the last several years repeatedly show that students who participate in this program have significant positive changes in knowledge and attitudes related to environmental health and science in general, they are more engaged in the classroom, and their scientific and analytical skills improved.

To ensure that the use of animals in the WInSTEP program is ethical and scientifically justified, and that the animals are treated humanely and have quality care, there is careful oversight by the Animal Care Program at UW-Milwaukee. In addition, teachers in the program undergo training in the ethical use of animals in research, which is taught by the Research Animal Veterinarian at UW-Milwaukee. Also, teachers must sign an agreement that they will care for the fish according to the regulations in the NRC ILAR “Guide for the Care and Use of Laboratory Animals.” This is very important because:
• there are extensive federal regulations, requiring that rules and oversight must be followed whenever animals are used in research;
• students learn how to work with the embryos and fish under the teacher’s supervision. They experience how to properly care for the animals. In the process, they develop a sense of responsibility for other living beings;
• using animals in biological studies is important for helping students understand living processes and is a critical part of the learning experience that teaches students to respect all life and to treat the animals humanely; and
• students develop a broader understanding of how and why animals are important to biological research and that the results are meaningful to them and to society.

The UWM WInSTEP program is committed to providing students with a unique opportunity to experience scientific research first-hand, increasing student engagement, and improving scientific literacy. If you have any questions about the UWM WInSTEP program, please contact the program’s co-Principal Investigators at:

Co-Principal Investigators

David Petering, PhD
Distinguished Professor of Chemistry and Biochemistry
University of Wisconsin-Milwaukee
petering@uwm.edu
414.229.5853

Craig Berg, PhD
Professor of Curriculum and Instruction
University of Wisconsin-Milwaukee
caberg@uwm.edu
414.229.4047

“It was applicable to human life and overall organisms. Toxins are so present in the environment, and seeing some ‘real life’ results of these toxins is worth the effort for us as students.” ~ WInSTEP Science Student

“The module was very helpful to know how things in the world can really affect humans and even animals. I had a fuller understanding after the lab to know how being exposed to something so dangerous and affective can really put an impact on behavior.” ~ WInSTEP Science Student

UNIVERSITY of WISCONSIN
UWMILWAUKEE