INTRODUCTION:
The purpose of this collaboration was to:
•design an inquiry-based learning experience that addresses state and district science content standards about food preservation and microbes (7.4),
•provide an opportunity for students to explore the relationships between environmental conditions, microbial actions and food preservation techniques, and
•have students improve scientific inquiry and literacy skills and learn basic classroom microbiology techniques.

METHODS:
Part 3: Exploration: Microbial Action on Peas Students design/conduct investigations to manipulate environmental conditions to promote or inhibit bacterial growth on peas.
Part 4: Exploration: Environmental Sampling Students apply knowledge of environmental conditions and growth to test for microbes.
Part 5: Yogurt-Making Students make yogurt to apply knowledge of beneficial bacteria, environmental conditions and pH.

LEARNING GOALS:
Students will:
1. Understand and describe conditions necessary for microbial growth.
2. Explain ways to prevent bacterial contamination.
3. Learn and utilize basic classroom microbiology tools and techniques.
4. Identify questions about microbes that can be answered through scientific investigation.
5. Design investigations to explore relationships between environmental conditions and microbe growth.
6. Analyze experimental data, draw conclusions, provide explanations to research questions and identify sources of error.
7. Communicate findings verbally and in written reports.

DISCUSSION:
The project was an absolute success because collaboration between teacher and researcher enabled students to engage in a dynamic standards-based inquiry lab experience in the classroom.

Quantitative data shows measurable gains in content knowledge. Equally important was the improvement in scientific inquiry and laboratory skills. Students with diverse learning needs demonstrated the ability to create research questions, design inquiries, manipulate variables, collect and analyze data and communicate their findings.

Qualitatively, student interest was extremely high as evidenced by the many students who came to class early and stayed after class to work on their projects. This project generated greater enthusiasm for learning than any unit throughout the year.

STUDENT PERFORMANCE:
Students expressed tremendous interest in microbes, food preservation, laboratory experiments and research. All learning goals were met. Student content knowledge and research skills improved. Students independently created lab reports to communicate findings. By the end of the learning unit, students were able to pose research questions and successfully design and conduct experiments with little guidance.

SELECTED REFERENCES
WiSTR. http://www.wcsu.edu/biology/wistr_home.html
Microbe World Resources. http://www.microbeworld.org/resources/