

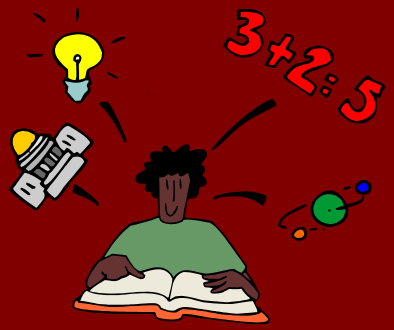
Secondary Science Teaching in Rural Michigan

A Model Program for Teacher Retention and Renewal

We are part of a world-wide reform in science education

- Traditional science teaching
  - Emphasized content coverage & memorization
  - Effective with only the top students
- Reform movement
  - Emphasizes teaching ALL STUDENTS for understanding & application of science knowledge

Rationale



- Science Education Reform puts new demands on science teachers
  - To teach a wider spectrum of students
  - To teach for understanding and application of science knowledge
- Our project addresses these demands
  - Using LTER research
  - Using Research on Teaching & Learning

Objective: To test a model to enhance teacher retention & renewal

- Expand & deepen teachers' understanding of ecological content & pedagogy
- Provide access to appropriate applications of educational technology
- Nurture development of a group of local teacher leaders to stimulate reform
- Assess the effectiveness of the model

Key Players

- 60 teachers grades 4 - 12 in 12 small to mid-sized rural districts in Michigan
- Research scientists from MSU and the Kellogg Biological Station
- Science educators from MSU & beyond
- Graduate research assistants who work with teachers in schools

Key Activities

- Academic Year Workshops
  - New content knowledge
  - New pedagogical knowledge from research on teaching and learning
  - Internet support
- Summer Institutes
  - Similar approach but greater depth
  - Experiential Science
  - Leadership training

Key Activities (continued)

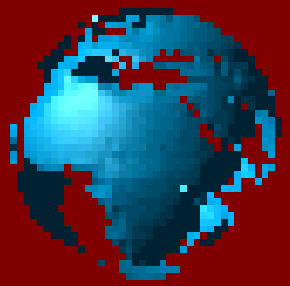
- Building level support
  - Graduate research assistants working with teachers as a science content resource
- Mini-grants
  - Support teachers in improvements in school-based work
- Scholarships
  - Support teachers for further academic work

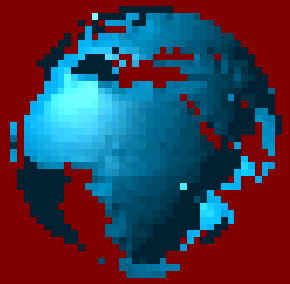
Questions Teachers Struggle **to Answer**

How can we keep up with new teaching trends in science?

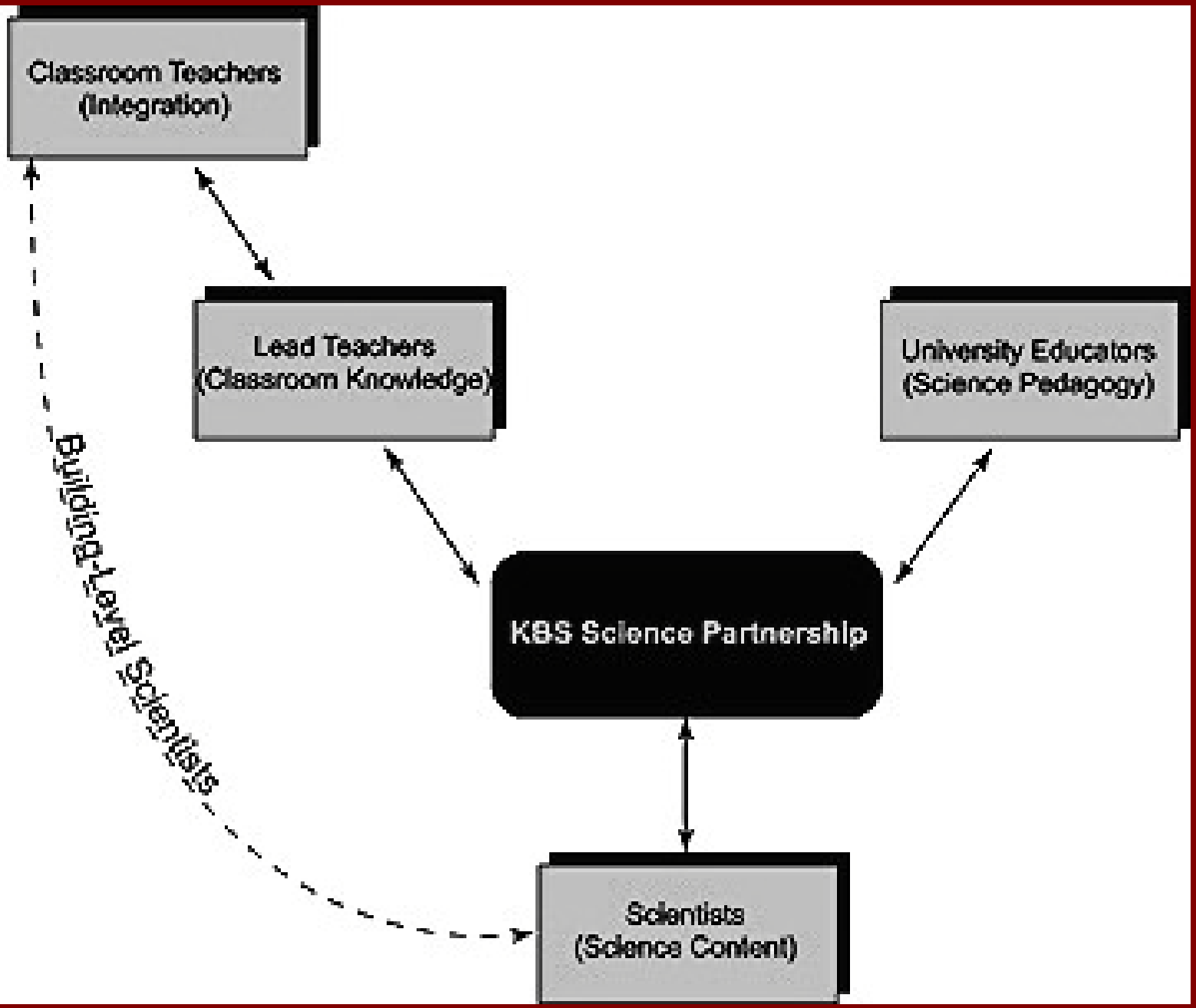
How can we keep up with the changes and advances in Science?

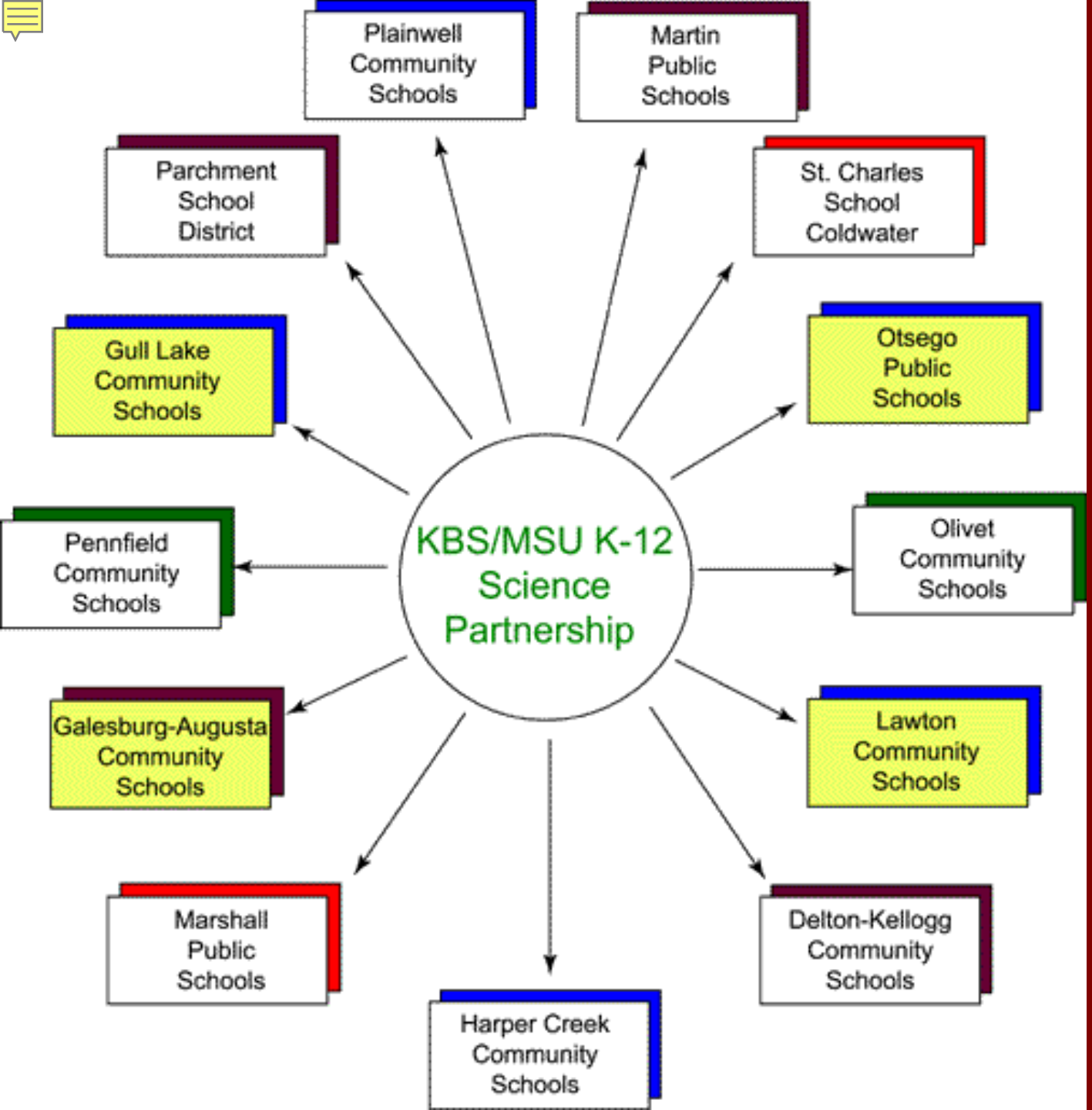
How can we meet the needs of our students?





PROJECT MODEL





Current Participating Districts

Building Level Scientists




Advanced Ph.D. Students

Post Doctoral

Scientist's Share Their Talents and Knowledge

Resources

- Link to teachers and other scientists
- Communication
- Grants
- Time to share ideas and work with peers
- New classroom instructional methods
- Long-term Commitment
- Data Access

schoolyard
Long Term Ecological Research

Kellogg Biological Station

Wonderful Facilities and a Fabulous Location


MAKE PREDICTIONS
LOOK FOR RELATION-SHIPS
SKIM
SUMMARIZE
SET A PURPOSE FOR READING

W. K. Kellogg Biological Station ♦ Michigan State University

K12 Partnership for Science Literacy

- Forming a Partnership and creating Lead Teachers
- Linking Research Scientists and Building Level Scientists
- Improving Science content knowledge
- Improving classroom instruction
- Providing Resources
- Improving Science Literacy