

## FIPR Teacher Mini-Grants Funded 1998-2003

### Status Key

I= incomplete  
C= compiled  
P= publishing

Note: All these units have been pilot tested and are currently being compiled and reviewed for public access. If there is a unit you are interested in, please check with the education staff. A limited number of draft copies are available for some units. Additional lesson plans on specific topics are also available soon on the FIPR Web page. Benchmarks listed here refer Florida Sunshine State Standards for Education that each unit meets.

Status	Authors	School	Year	Project Title	Grade	Benchmarks	Description
Primary							
P	Kim Van Hook Lynda Norton	Hillcrest Elementary	1999	How Does Your Garden Grow?	K	Language Arts, Math, Science SC.F.1.1.5, SC.G.1.1.3, SC.G.2.1.1, SC.G.2.1.2, SC.H.1.1.3	Students learn the parts of a plant and the nutrients plants need by planting a garden of green beans and fertilizing only half of it. Activities also teach how fertilizer is made and why phosphate is needed in fertilizer.
C	Sharon Newsome	Lewis Elementary	1998	Investigating Rocks and Minerals	1	Language Arts, Math, Science, Social Studies, Music and Foreign Language  LA.A.1.1.3, LA.A.1.1.4, LA.A.2.1.3, LA.B.2.1.4, LA.A.2.1.1, LA.A.2.1.2, LA.A.2.1.3, LA.B.2.1.1, LA.B.2.1.2, MAMA.3.1.2, MA.A.4.1.1, SC.A.1.1.1, SC.A.1.1.2, SC.A.1.1.3, SC.A.2.1.1, SC.D.1.1.1, SS.A.1.1.4, MU.A.1.1, FL.C.1.1	Students will learn how minerals in the ground affect the health of plants and animals through interactions with high school chemistry students who describe the phosphate molecule and mining processes. Art activities such as creating pop-up books and flipbooks show how rocks are formed.
C	Lesli Aracri Janet Paxton Marge Winfree	Bartow Academy	1998	What Makes Work Simple?	2	Language Arts, Math, Science, Social Studies, Visual Arts  LA.B.2.1.1, LA.B.2.1.2, LA.C.3.1.2, MA.A.4.1.1, MA.B.1.1.2, SS.B.2.1.2, VA.A.1.1.1	Students learn about simple machines and how they are used in reclamation. Then they use simple machines to construct a schoolyard habitat.
C	Sally Cosce Metta Rae O'Bryant	Hillcrest Elenentary	2000	Mineral Miners and Rock Rangers	1	Science SC.A.2.1.1:1, SC.D.1.1.1:1, SC.H.1.1.5:1	Students learn how rocks and minerals affect their lives. After reading about phosphate mining and reclamation, students "mine" their schoolyard and make journal entries of findings. They take the treasures they found while mining their schoolyard and create jewelry they then sell. Students also visit a phosphate mine.
C	Kim Van Hook Lynda Norton	Hillcrest Elementary	2000	Down on the Farm	K	Language Arts, Science	Students learn the importance of phosphate in cattle

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						LA.A.1.1.3, LA.A.1.1.2, SC.F.1.1.1, SC.F.1.1.2, SC.G.1.1.1, SC.G.1.1.2, SC.G.1.1.3, SC.G.2.1.1, SC.G.2.1.2, SC.H.1.1.3	feed. Students visited a working farm and the Mulberry Phosphate Museum and wrote books about farm animals, types of farms, and the links between feed, farming, and food. Baby chicks were hatched in an incubator (any hatchlings not adopted by students were given to a petting zoo). The culmination of the unit was a feast with farm-themed activities.
C	Sally Cosce Metta Rae O'Bryant	Hillcrest Elementary	2001	The Ocean's Treasures	1	Science and Social Studies SC.D.1.1.1, SC.D.1.1.3, SS.A.1.1.1, SS.B.2.1.4, SS.A.5.1.2	First graders study how ocean life contributed to the formation of phosphate in Florida. They also visit Bok Tower Gardens, the highest point on the Lake Wales Ridge, the see for themselves one of the first parts of Florida to emerge from the sea as the state formed over millions of years.
C	Allison Crutchfield Virginia Richard	Wahneta Elementary	2001	Phosphate, Food and Plant Nutrition	1	Language Arts, Visual Arts LA.A.1.1.4, LA.B.1.1.1, LA.B.1.1.2, VA.A.1.1.1, VA.B.1.1.1	Students learn that phosphate passes from one organism to another in food chains. Math and science lessons included the measurement and classification of foods. Sequencing is put to uses as students explore the steps in mining phosphate, making it into fertilizer and using it in plant nutrition.
C	Patty Lance	Eagle Lake Elementary	2001	Phosphate and Transportation of Materials	1-2	Math, Science MA.A.3.1.1, MA.D.1.1.2, SC.C.1.1.1	This unit is on business and economic aspects of the phosphate industry. It focuses on the transport of materials and includes an overview of phosphate mining, beneficiation, and land reclamation. Students build a model of the transportation cycle in the industry and use computers to research information about heavy equipment on-line.
C	Marti Stanley	Eagle Lake Elementary	2001	Phosphate, Shipping and Careers	K-1	Language Arts, Social Studies LA.A.1.1.2, LA.B.1.1.2, SS.A.2.1.2	This unit introduces the careers related to the phosphate industry and the transportation of materials. It uses the "Trucker Buddy" program by CTL Distribution, Inc. It provides practice in reading comprehension, map skills and expository writing
I	Kathi Decker	Eagle Lake Elementary	2003	It's a Dirt-y Job	1-2	Language Arts, Science, Social Studies LA.C.1.1.3, LA.C.1.1.4, LA.C.3.1.1, LAC.3.1.2, LA.C.3.1.3, LA.C.3.1.4, LA.B.2.1.3, LA.C.2.1.2, LA.D.2.1.1, LA.D.2.1.3, SC.H.1.1.5, SC.G.2.1.2, SC.H.3.1.1, SS.A.2.1.3, SS.A.2.1.4, SS.A.2.1.5,	Independent learning stations are used in this unit to introduce concept about rocks, minerals, phosphate mining, phosphate processing, and fertilizer production Students are provided with wide variety learning experiences. They read, watch videos, listen to guest speakers, interview workers, take field trips, write to pen pals, create PowerPoint presentations. They also host a job fair and provide guided tours for any parents and students in their school wanting to learn more about careers available in the phosphate industry..

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						SS.B.2.1.3, SS.B.2.1.4, SS.D.2.1.1, SS.D.5.1.2, SS.D.5.1.3	
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Intermediate							
C	Alice Black Amy Murphy Jerry Schuck	Bartow Academy	1999	Life In A Pond	3	Language Arts, Math, Science, Social Studies  LA.A.2.2.2, LA.A.2.2.5, LA.A.2.2.8, LA.B.1.2.1, LA.C.1.2.1, LA.C.1.2.3, LA.E.1.2.3, LA.E.2.2.3, MA.E.1.2.1, MA.E.2.2.2, MA.E.3.2.1, SC.B.1.2.1, SC.H.2.2.1, SC.G.1.2.5, SC.F.1.2.1, SC.G.2.2.3, SC.G.2.2.2, SC.G.2.2.1, SC.F.1.2.2, SS.B.1.2.1, SS.B.1.2.2	Students learn about the pond habitat and the interrelationship between plants and animals. They also learn about phosphate mining and explore the threat such land disturbances can pose to the wetland habitat they are learning about.
C	Julie Allen	Alturas Elementary	1999	Mining and the Sandhill Habitat	3	Language Arts, Math, Science, Social Studies  LA.A.2.2.5, LA.B.1.2.1, MA.B.1.2.1, MA.B.1.2.2, MA.E.1.2.1, SC.B.2.2.1, SC.B.2.2.2, SC.D.2.2.1, SC.F.1.2.2, SC.G.2.2.1, SS.B.2.2.2, SS.B.2.2.3	Students learn the reasons for mining and how the processes affect the Sandhill habitat. They build an understanding of what a Sandhill habitat is by replanting a schoolyard area with plants native to a Sandhill habitat. Students write original stories about how animals in a Sandhill habitat are affected by mining.
P	Sandra Bush Linda Hughes Jennifer Insua	Bartow Academy	1998	Prehistoric Florida, Fossils and Phosphate	4	Language Arts, Math, Science, Social Studies, Visual Arts  LA.A.2.2.5, LA.A.2.2.6, LA.B.1.2.1, LA.B.2.2.1, LA.B.2.2.3, MA.A.1.2.1, SC.B.1.1.3, SC.B.1.2.1, SC.D.1.1.1, SC.D.1.2.1, SC.D.2.1.1, SC.D.2.2.1, SC.H.3.1.1, SS.A.1.2.3, VA.C.1.2.1, VA.C.1.2.2, VA.D.1.2.2	Students open their year of exploring Florida history by learning what prehistoric life was like in Florida and how fossils are related to the formation of Florida's phosphate deposits. They learn about the phosphate industry that mines these deposits and processes the phosphate into fertilizer. They learn how this industry shaped local history & economy through. The unit includes FCAT practice and the integration of technology.
C	Julie Allen	Alturas Elementary	2000	The Land Returned	4	Language Arts, Math, Science, Social Studies  LA.A.2.2.5, LA.A.2.2.8, LA.B.1.2.1, LA.B.1.2.2, LA.B.1.2.3, MA.B.1.2.1,	This unit investigates links between phosphate and wildlife, and between mining and the local economy. The class visited a mine and the Mulberry Phosphate Museum and heard a speaker discuss mining careers. Students wrote and illustrated a book on habitat changes to mined lands as seen through the eyes of a gopher

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						MA.B.1.2.2, MA.E.1.2.1, SC.B.2.2.1, SC.B.2.2.2, SC.G.2.2.1, SS.A.6.2.2, SS.A.6.2.3, SS.B.1.2.2, SS.B.2.2.2, SS.B.2.2.3	tortoise.
I	Anne Lewis-Gonzales	Winston Elementary	2002	Special Homes	3	Language Arts, Math, Science  LA.A.2.2.5, LA.A.2.2.8, LA.B.2.2.1, LA.B.2.2.2, LA.B.2.2.3, MA.A.4.2.1, MA.B.1.2.2, MA.A.1.2.3, SC.B.2.2.1, SC.D.1.2.2, - SC.D.1.2.3, SC.F.1.2.2 SC.G.1.2.3	Water is the focus of this unit that explores focuses on natural habitats of Central Florida and the strategies and stages of reclaiming land after phosphate is mined. Speakers will discuss Florida's wet habitats and water pollution and the difference between threatened and endangered species. Field trips include the Florida Aquarium and a reclamation site. Students apply what they learn in their own schoolyard.
I	Mijana Lockard	Sikes Elementary	2002	Facts for the Phosphomania Website	5	Language Arts, Math, Science LA.A.2.2.3, LA.A.2.2.5, LA.A.2.2.6, LA.A.2.2.8, LA.B.1.2.1, LA.B.2.2.3, LA.B.2.2.4, LA.C.1.2.1, LA.D.2.2.3, LA.D.2.2.5, MA.A.4.2.1, MA.B.1.2.1, MA.B.1.2.2, MA.B.2.2.1, MA.B.2.2.2, MA.B.3.2.1, MA.B.4.2.2, MA.E.1.2.1, MA.E.1.2.3, MA.E.3.2.1, MA.E.3.2.2, SC.A.1.2.1, SC.A.1.2.4, SC.A.1.2.5, SC.G.2.2.3, SC.H.1.2.1, SC.H.1.2.2, SC.H.1.2.4, SC.H.1.2.5, SC.H.3.2.3, SC.H.3.2.4	Students learn about the importance of phosphate, the processes of mining, beneficiation, chemical processing, reclamation and related environmental issues through experiments, research, speakers and field trips. They then analyze and compile this information into different points of view to design and maintain an informative website for the community.
C	Patty Lance	Eagle Lake Elementary	2002	Rocks Rock!	3	Language Arts, Math, Science, Social Studies  LA.A.1.2.1, LA.A.1.2.4, LA.A.2.2.1, LA.A.2.2.5, LA.A.2.2.8, LA.B.1.2.1, LA.B.1.2.2, LA.B.1.2.3, LA.B.1.2.3, LA.B.2.2.1, LA.B.2.2.3, LA.B.2.2.4, LA.B.2.2.6, LA.E.2.2.4, MA.A.1.2.2, MA.1.2.3, MA.A.3.2.1, MA.A.3.2.3,	This unit on rocks and minerals has students use the scientific method of thinking to explore Florida's geology and phosphate deposit as well as rocks and minerals around the world. Students will study rock types, crystals, erosion, and non-renewable resources then conduct experiments and prepare written reports. A field trip to the Museum of Science and Industry allows students to perform an archeological dig.

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						<p>MA.B.1.2.1, MA.B.1.2.2, MA.B.2.2.1, MA.B.2.2.2, MA.B.3.2.1, MA.B.4.2.2, MA.D.1.2.1, MA.D.2.2.2, MA.E.1.2.1, MA.E.1.2.3, MA.E.3.2.1, SC.A.1.2.1, SC.A.2.2.1, SC.B.2.2.2, SC.D.1.2.1, SC.D.1.2.4, SC.H.1.2.1, SC.H.1.2.2, SC.H.1.2.3, SC.H.1.2.4, SC.H.3.2.2, SC.H.3.2.4, SS.B.2.2.3, SS.B.2.2.4</p>	
I	Barbara Rose	Purcell Elementary	2002	What in the World is a Vegetable?	5 ESE	<p>Language Arts, Math, Science, Social Studies</p> <p>LA.A.1.2.1, LA.A.2.2.2, LA.A.2.2.6, LA.B.1.2.1, LA.B.2.2.1, LA.B.2.2.4, LA.C.1.2.1, LA.D.2.2.2, MA.A.1.2.1, MA.A.3.2.1, MA.A.4.2.1, MA.B.1.2.1, MA.B.1.2.2, MA.B.3.2.1, MA.C.1.2.1, MA.E.1.2.1, MA.E.1.2.3, SC.A.1.2.1, SC.B.1.2.1, SC.B.1.2.4, SC.D.2.2.1, SC.F.1.2.3, SC.G.1.2.1, SC.G.1.2.3, SC.G.1.2.4, SC.G.1.2.6, SC.G.2.2.1, SS.A.6.2.5, SS.D.2.2.1</p>	Hands-on learning is the highlight of this unit that teaches how nutrients in fertilizer soil promote healthy vegetables. They plant, tend, fertilize and harvest their own garden. They fertilize with manure and commercial products. They then make scientific observations through comparisons of different plots. Information learned from the experience will be shared with students from other grades and schools.
I	Leslie Taylor	Winston Elementary	2002	Phosphate and the Scientific Method	4-5	<p>Language Arts, Math, Science, visual Arts</p> <p>LA.B.1.2.1, LA.B.2.2.1, LA.C.1.2.1, LA.C.2.2.2, MA.C.3.2.1, MA.C.3.2.2, MA.D.2.2.2, MA.E.1.2.1, SC.D.1.2.5, SC.D.1.2.1, SC.B.2.2.2, SC.H.1.2.1, SC.H.1.2.2, SC.H.1.2.3, SC.H.1.2.4, SC.H.1.2.5, SC.H.2.2.1, SC.H.3.2.1, SC.H.3.2.2, SC.H.3.2.3, SC.H.3.2.4, VA.A.1.2.1</p>	This unit teaches the difference between the scientific method and experimental design through phosphate-related activities designed to teach each step of the scientific method. It uses an interactive geology kit <i>Kids Dig It!</i> that lets students identify fossils and following the clues they provide to understand how Florida's phosphate deposit formed. They will also use water and soil testing at a lake created from a mine pit and an unmined lake, to collect and examine data, pose questions and begin to contemplate the what needs to be considered when designing and executing reclamation of mined land.

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I	Valerie Meadows	Eagle Lake Elementary	2003	Virtual Greenhouse	4	Science SC.G.1.2.2, SC.G.1.2.1, SC.G.1.2.7	Florida's native habitats and the reasons certain plants grow in each habitat are investigated along with the benefits of native vs. non-native species. Information is shared with others through the creation of a virtual scavenger hunt using digital pictures of various plants taken on the school grounds and English Creek Environmental Education Center.
I	Tena Mathis	Eagle Lake Elementary	2003	Messing It Up and Fixing It Back – Florida's Land, That is	4	Math and Science MA.B.1.2.1, MA.E.1.2.1, SC.D.2.2.1, SC.F.1.2.1, SC.G.1.2.5, SC.H.1.2.3, SC.H.1.2.5, SC.H.3.2.X	A model of Florida's strata, a mine site and beneficiation plant will be created as the students learn how phosphate is mined and processed in Florida. Students will also consider the impacts of phosphate mining on the environment and public health after they learn about Florida's reclamation law, clay settling ponds and phosphogypsum stacks.
I	Peggy Sue Koren	Eagle Lake Elementary	2003	I Owe My Soul To the Company Store	4	Language Arts, Social Studies LA.A.2.2.1, LA.A.2.2.5, LA.A.2.2.8, LA.B.1.2.1, LA.B.2.2.1, LA.C.1.2.X, SS.A.6.2.4, SS.B.1.2.1, SS.B.2.2.2, SS.B.2.2.3, SS.D.1.2.1	A school in Florida and a school in West Virginia use technology such as email, video conferencing and net meetings to compare two mining industries coal and phosphate. Students will examine the historical impact each industry had on their communities through company towns and or camps.

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Middle							
C	Mary Ellen Adlam	Lake Alfred Middle School	1998	Exploring Our Backyard	6	Language Arts, Math, Science, Social Studies, Technology  LA.A.2.3.4, LA.B.1.3.1, LA.B.2.3.4, LA.C.1.3.4, MA.A.4.3.1, MA.B.2.3.1, MA.B.4.3.1, MA.B.4.3.2, SC.F.1.3.1, SC.G.2.3.1, SC.H.1.3.5, SC.H.3.3.5, SS.B.1.3.1, SS.B.1.3.5, SS.B.1.3.6, SS.B.2.3.4, SS.B.2.3.6	This is a fully integrated unit in which students learn about the water quality, starting on school grounds and branching out to investigate surround areas. Reclamation and restoration efforts are introduced through exploration of various careers in the community.
I	Patricia Stepp	Kathleen Middle School	1998	Simple Machines-How They Make Life Easier	6	Language Arts, Math, Science  LALA.1.3.1, LA.A.1.3.2, LA.A.1.3.3, LA.A.1.3.4, LA.B.1.3.1, LA.B.1.3.2, LA.B.1.3.3	Students learn how simple machines are combined to make complex machines like those used to make work easier in mining of phosphate and reclamation.
C	Susan Glynn	Kathleen Middle School	1998	Stewardship In Action	6	Language Arts, Science, Social Studies  LA.A.1.3.4, LA.B.2.3.1, LA.B.2.3.2, LA.C.3.3.3, SC.D.2.3.2, SSC.2.3.6	Students visit TENOROC, a previously mined site, and research and report on its origins. Efforts are made to improve the future of the site through tree planting & other activities.
IC	Mary Ellen Adlam Donna Ellis Danielle Jones Kay Robertson	Lake Alfred Middle School	1999	Millennium Connection	6	Language Arts, Math, Science, Social Studies  LA.2.3.5, LA.B.1.3.1, LA.B.2.3.4, MA.A.1.3.4, MA.A.3.3.1, MAMA.3.3.2, MA.A.3.3.3, MA.B.1.3.4, MA.B.4.3.1, MA.E.1.3.3, SC.A.1.3.4, SC.A.1.3.5, SC.B.2.3.1, SC.B.2.3.2, SC.D.2.3.1, SC.D.2.3.2, SC.G.2.3.1, SC.G.2.3.1, SS.G.1.3.1, SS.G.1.3.6	Students study the role phosphate plays in their local geography and economy through field trips to local sites that operate under principles of science and mathematics.
I	John Massung	Marshall Middle School	1999	Processes That Shaped Our Planet	8	SC.D.1.3	Students examine the geological processes that shaped the Florida phosphate deposits and the Earth and careers related to mining and preparation of phosphate.

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I	John Madden	Lake Alfred Middle School	2001	Florida's Geology	8	Math, Science SC.B.2.3.2, SC.C.2.3.4, SC.D.1.3.1, SC.D.1.3.2, SC.D.1.3.4, SC.F.2.3.4, SC.G.1.3.3, SC.G.2.3.1	Students study Florida's geologic history and time scale and processes relating to sedimentary rock, phosphate, and fossil formation. During a field trip, teams of students will dig for fossils, using techniques presented through use of InSite Learning Labs' "Kids Dig It!" kits, and observe phosphate mining and beneficiation.
I	Charlotte Butler	Lake Alfred Middle School	2001	Coronet: Study of a Company Town	8	Language Arts, Social Studies LA.B.1.3.2, LA.B.2.3.2, SS.A.6.3.4, SS.A.6.3.5, SS.D.3.1.3, SS.B.1.3.1	Students review the prehistoric beginnings of phosphate, and then study early and modern mining, processing, and worldwide distribution. Students take a field trip to the former company town of Coronet, to learn about the early days of the industry and its role in local history. They also go to the Port of Tampa, to better understand the distribution of phosphate from mine and fertilizer plant to the port and to markets in the United States and overseas. Students read in primary sources and use audio-visual materials, creative writing, mapping, and economic models in this integrated unit
C	Sharon Casey	Stambaugh Middle School	2001	Florida's Geology, Phosphate and Food	7	Science SC.D.1.3.2, SC.F.2.3.4, SC.G.2.3.1, SC.A.1.3.5, SC.D.1.3.4	Hands-on activities drive the lessons of this unit and lead to discovering the relationship of the formation of phosphate to Florida's geological features by examining topographic maps. The importance of phosphate will be introduced as it applies to plant growth and cell processes that require energy.
I	Susan Hutchison	Jewett Academy	2001	Reclamation and Florida's Native Habitats	7	Science SC.D.1.3.3, SC.D.2.3.2, SC.G.1.3.4, SC.G.2.3.1, SC.G.2.3.3, SC.G.2.3.4, SC.H.1.3.4	Four distinct ecosystems in Polk County that can be affected by man's interaction with the environment through phosphate mining are identified using GPS equipment and digital cameras and the impacts of permitting and reclamation are investigated. The knowledge gained will be applied to creating a native plant garden and design a way to remove invasive exotic plants and replace them with natives.
I	Kitty Walker	Lake Alfred Middle School	2001	Florida, Phosphate and Agriculture: The Gifts of the Earth	8	Language Arts, Math, Science LA.A.2.3.2, LA.B.1.3.1, LA.C.1.3.4, MA.A.4.3.1, MA.D.1.3.2, SC.H.1.3.5	Students use measurement, conversion and graphing skills to plan, plant, fertilize and harvest strawberries grown with and without fertilizer in a greenhouse. Data collected is used to produce graphs, charts and essays that describe the relationship between quantity and quality of crops and fertilizer use.
I	Donna Jo Walker	Lake Alfred Middle School	2001	Phosphate and Florida: <i>A Land Remembered</i>	7-8	Language Arts, Math, Science,	Through a study of literature, students will learn about

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						<p>Social Studies</p> <p>LA.A.1.3.1, LA.B.1.3.1, MA.B.4.3.2, SC.D.1.3.2, SS.A.6.3.2</p>	<p>all the influences that have changed Florida's native habitats from the civil war to the present time. Since no literature exists about the phosphate story, students will practice narrative and expository writing through prompts based on phosphate and its impact on the land</p>
I	Pam Caffrey	Mulrennan Middle School	2003	Project Mirror	8	<p>Science</p> <p>SC.D.2.3.1, SC.D.2.3.2, SC.G.1.3.4, SC.G.2.3.2, SC.H.1.3.4</p>	<p>Students learn the process the phosphate industry goes through to survey land, plan for reclamation and get approval of the plans even before mining. They then mirror the process as they use this information to reclaim a piece of the school property that was disturbed by recent construction. Their reclamation includes obtaining permission from the School's Advisory Committee.</p>

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High							
I	Nancy Smith	Lake Gibson High School	1998	TENOROC: Hands-on Science	9-10	Science SC.G.1.4.1, SC.G.1.4.2, SC.G.2.4.2	This is an introduction to native and exotic species in Florida through observing what is present at TENOROC, a site with mined and unmined, reclaimed, and unreclaimed land.
I	Roberta Matousek	George Jenkins High School	1999	Comparison of Lake Water Quality	10-12	Science SC.H.1.4.1, SC.H.1.2.1, SC.H.1.2.2, SC.H.1.4.4, S.G.2.4.2, SC.G.2.4.4, SC.G.2.4.5, SC.G.2.4.6,	Students learn correct procedures for several kinds of water tests then do field testing on natural, mined and reclaimed lakes. They then organize analyze the data while practicing the scientific method.
I	Bruce Dubendorff	Lake Gibson High School	1998	Radiation, The Phosphate Industry and Public Health	9-12	Math, Science	Students learn about radiation as it relates to public health. Demonstrations include half-life of radioactive isotope and the relationship of radiation to phosphate.
C	Roberta Matousek	George Jenkins High School	2000	Phosphate Mining and Reclamation	10-12	Science	Students do research via the Florida Department of Environmental Protection (DEP) website, they go to Cargill' Crop Nutrition's Hookers Prairie site and plant, upland and wetland species there. Then they apply what they learned about native species and reclamation to land made available by local owners. After soil analysis, students removed exotic species, graded the land, and planted native species. Students reclaimed fields, pasturage, and backyards.
I	Rae McKinney	Winter Haven High	2001	Real Applications of Physical Science in the Phosphate Industry	10-12	Science SC.G.2.4.5, SC.H.1.4.1, SC.H.1.4.4, SC.H.1.4.7, SC.H.3.4.3, SC.H.3.4.4	Fundamental principles of physics and chemistry will be examined as they apply in stages of phosphate mining, beneficiation and processing, as the culminating review after a year's worth of classroom lessons and activities.
I	Donna Cole	Kathleen High	2002	A Controlled Experiment Comparing Fertilization with Fertigation	9-12	Language Arts, Math, Science, Social Studies LA.B.2.4.1, MA.E.1.4.1, SC.D.2.4.1, SC.G.2.4.3, SC.H.1.4.1, SS.B.2.4.4, SS.B.2.4.7	This project-based unit teaches the importance of phosphorus in plant growth and its significance to living things through the planning, execution and analysis of a controlled growth experiment using citrus trees and tomato plants. Traditional fertilization techniques and fertigation systems will be used and results compared.
I	Robert Knepper	Haines City High	2002	Real Chemistry	10-12	Language Arts, Science	Field experiences in phosphate beneficiation and

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1998-2003**

						LA.A.1.4, LA.B.1.4, LA.B.2.4, SC.A.1.4, SC.D.1.4, SC.H.1.4, SC.H.2.4, SC.H.3.4	chemical processing plants are designed to teach how science, specifically chemistry, is used daily in the real world. Students receive instruction on the scientific method, technical writing for reporting and seeking funds for research, and the chemistry of phosphate.
I	Craig McKee	Lakeland High	2002	"When I Was Your Age,"	9-12	Language Arts, Social Studies  LA.A.2.4, LA.B.1.4, LA.C.1.4, LA.C.3.4, LA.D.2.4	A remedial English class teaches primary source research and the oral and written language skills needed to create an oral history of the phosphate industry in Polk County. Instruction includes topics such as: how writers use language and history to make money: how historical artifacts are collected, classified and organized in museums; and how phosphate is mined and processed today. Experiences include field trips to museums and phosphate mines and interviews with former employees.
I	Nancy Taliancich	Haines City High	2002	Building a Better Dragline	11-12	Language Arts, Math, Science, Social Studies  LA.A.1.4.2, LA.A.1.4.3, LA.A.2.4.4, LA.B.2.4.1, LA.B.2.4.4, LA.D.2.4.6, LA.B.2.4.1, LA.D.2.4.4, LA.D.2.4.6, MA.B.1.4.3, MA.B.2.4.1, MA.B.2.4.2, MA.B.4.4.2, MA.D.1.4.1, MA.D.1.4.2, MA.E.1.4.1, SC.B.1.4.1, SC.B.1.4.6, SC.B.1.4.7, SC.C.2.4.6, SC.G.2.4.1, SC.G.2.4.5, SC.G.2.4.6, SC.H.3.4.1, SC.H.3.4.4, SC.H.3.4.5, SC.H.3.4.6, SS.A.1.4.2, SS.A.1.4.4, SS.B.2.4.1, SS.B.2.4.7, SS.D.1.4.1	The historical development and use of a dragline is presented and its current design is studied as it relates to the mechanical work done by simple machines, the electrical work done by motors and the power required to accomplish the work of mining phosphate rock. The students produce a PowerPoint presentation detailing the technologic development energy requirements of Florida's phosphate industry. They also visit a dragline to observe how it operates and is constructed and then design and build a working model dragline that will lift 200 grams of sand a distance of 50 cms, using pulleys and motors..