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Lesson Plan Title: Creating A Pine Barrens and NJ Native Species Rain Garden Habitat	State: NJ
Lesson Time Frame:	Inspired by an Earthwatch Expedition: Butterflies of Vietnam
Student Level: Elementary and Middle School	

LESSON PLANS & COMMUNITY ACTION/PROJECT NAME»

Project Title:

Creating A Pine Barrens and NJ Native Species Rain Garden Habitat

Summarize your project, including the key components of teacher and student activities and use of technology

The Mullica Township School System (PK - 8) is perched on the fringe of the ecologically sensitive Pine Barrens of southern New Jersey. School grounds were disturbed during an \$8 million building renovation and construction process. Two school areas (an enclosed, open-air courtyard, and grassy strip between grade-level wings) have not been targeted for extensive reclamation and professional landscaping. This project "Creating A Pine Barrens and NJ Native Species Rain Garden Habitat" was drafted to: 1. return the grounds to a natural state; 2. reintroduce native plantings and encourage their succession; 3. create an outdoor classroom and a living, life science laboratory; and 4. attract and conserve native bird, amphibian, and insect(butterfly) species. Four fifth-grade educators and one eighth-grade educator will integrate cross-curricular lessons (math, science, social studies, reading/language arts)and utilize existing district technology to create this native plant garden and animal habitats. Project lesson components will include: current land use survey; physical survey, including hands-on measurement; drafting/blueprint design; graphing; water (pH, contaminants, chemical content) and soil (water table, core borings, chemical content, composition) testing; the creation of written design proposals, public speaking; botanical and biological research; and information reporting. Technology to be utilized by staff and students will include, but is not limited to: digital/analog stereomicroscope, optic microscopes, digital projector, document camera/ELMO, digital video camera, laser measure, graphing calculators, individual PC's, and existing software.

Grade level(s) of students impacted by your project. Select all that apply:

- Kindergarten: Yes No
- 1st grade: Yes No
- 2nd grade: Yes No
- 3rd grade: Yes No
- 7th grade: Yes No
- 8th grade: Yes No
- 9th grade: Yes No

4th grade: Yes No

10th grade: Yes No

5th grade: Yes No

11th grade: Yes No

6th grade: Yes No

12th grade: Yes No

How many students will be impacted in the first year of your project implementation?

400

What subject area(s) does your project include?

The project cuts across the district curriculum and meets the New Jersey Core Curriculum Standards in: math, science, reading, language arts, technology, and social studies.

PROJECT DESCRIPTION, continued »

What will your students know and be able to do by the end of this project?

Students will be able to: measure and survey a land plot; design an ecologically sensitive native garden, river rock habitat, aquatic ponds; research and document native NJ flora and fauna; draft a plot plan to include an outdoor science laboratory; conduct field studies of local plant and animal species; train in water and soil sampling techniques; conduct water quality testing; determine chemical content/composition of soil; investigate physical weathering and soil erosion; devise and implement plans to prevent soil erosion and water retention; create scale models and layouts; conduct and implement a needs survey through poll of staff and student body; present individual design plans; create visual/digital plan presentations of designs under consideration; speak before public service, business owners, and government agencies to promote final project design and to seek funding/donations; compose letters to government agencies, public service groups, and business owners to solicit ideas, donations and support; fashion newsletter project updates for publication and distribution in school district and media; record data using measuring devices; generate graphs using graphing calculators and available software programs; design PowerPoint presentations; produce, film, edit, and transfer to CD-ROM or DVD format a video of the project; create student digital portfolios of personal contributions to the project; select and conduct fundraiser to support financial demands for supplies and materials; compose letters to building and trade unions requesting labor support; plan and implement a project groundbreaking ceremony; plan, schedule, and implement a construction schedule.

How will you use technology to support the teaching process (rather than teaching students to use technology)?

In support of the teaching process, HP Tablet PC's will be used by the team to: compile data gathered in field experiments; edit and review student portfolios and work documents; communicate with team members; generate full-screen images and visual data presentation in classroom; permit educators to assess student generated digital work outside the classroom; provide portable digital access to the school network; provide digital record retention of schedules, lesson plans, and data collected; build an electronic portfolio of the project; evaluate project progress.

In support of the teaching process, HP multimedia projectors will be used: within the classroom to project data, presentations, etc. in large, easily-read format for visual learners; presentation of student design plans; student instruction outside of the classroom environment; large-format presentation for students of project updates, schedules, and portfolio assessment by the group.

In support of the teaching process, the HP digital camera will be used: to provide a visual record of project; support student portfolio documentation; to record images of project site for posting on school

website; provide images of existing native flora and fauna in the township for instructional purposes.

This project is designed for groups of five teachers to collaborate together (vs. five individual teachers doing separate projects on their own). How does the project promote collaboration amongst all team members?

This project will promote collaboration between the 5th grade teaching team as cross-curricular activities and lessons will be designed to enhance and strengthen existing lesson plans. Rather than develop individualized lessons in isolation, the team will be able to fashion an entire unit plan as a group, and share in the design of lessons in subject areas taught as a team (math, reading, writing, language arts) Lessons taught in specialized areas of instruction (science and social studies) will be tailored to student needs by the team. Articulation amongst Middle School grade-level teachers (in order to direct student learning and activities) will occur as the result of the inclusion of an eighth grade teacher on the team. A working partnership between students on the 5th/6th/7th/8th Grade levels is necessary, as elements of the plan require varying degrees of student knowledge and expertise. This student mentoring arrangement will require frequent monitoring and communication between the five-teacher team and the Middle School teaching staff.

If applicable, please be specific about how math and/or science will be a part of the project.

Students will utilize maths concepts (data compilation, analysis, graphing, mapping, measuring, geometry, patterns, computation):in the initial land survey; to create plot plans and project designs; to calculate costs of materials; visually display data collected; to design geometric pattern for porous-block walkways; to create scale models and designs.

Students will utilize earth science, life science, and physical science concepts through: research of the appropriate native plant and animals species to be incorporated into the project design plan; investigation of habitats, species conservation, and environmental stewardship; conducting water and soil sampling and analysis; investigation of ecologically sensitive design plans and project materials; determination of water quality, chemical composition of soils, ecologically-sound fertilization schedules and natural pest management; research and investigation of preferred materials and construction methods; use and preparation of science laboratory equipment (microscopes, slide preparation).

PROJECT IMPACT, MEASUREMENT and ALIGNMENT »

What specific school goals does this project address, and how does it address them?

This project addresses several district-wide goals. It will provide instruction which has a meaningful relationship to the present needs and interests of our students. The project offers significant opportunities for helping students determine the nature of their educational experience. By incorporating technology into lesson plans through the addition of the HP equipment provided by a grant, the project increases opportunities for kinesthetic and environmental multiple-intelligence learners to participate in relevant, hands-on activities they need in order to process information and to effectively learn. A continuing goal of the administration has been to actively engage minority students in projects and activities in which they normally do not participate. The project also permits educators to implement activities that meet the New Jersey Workplace Readiness Standards by providing training and enhancing skills needed in "real-life" and the workplace. Finally, the project addresses the district goal to foster cooperation between the school, parents, and the community.

How will you measure the impact of this project on student learning in the classroom?

The impact on student learning in the classroom will be measured through the review of individual student-prepared electronic portfolios and group PowerPoint presentations. Administrators will conduct

periodic observations of staff-supervised student project activities.

How will you measure the impact of this project on the teaching process?

School administrators will be presented with regular team updates. The administrators will be informed of planned activities and lessons through the submission of weekly lesson plans. The team will submit student projects and exchange best practices with other HP Technology for Teaching Grant Awardees and HP grant monitors/technology experts, with an invitation to provide advice and an evaluation of said projects and practices. Students will be issued pre-project and post-project surveys to be reviewed by the team and school administrators.

How will your team ensure that successful collaboration takes place? This could include plans for meeting regularly, designing project activities together, ongoing communication, ways of evaluating progress, etc.

To ensure that successful collaboration takes place, the team will meet on a weekly basis, on scheduled in-service dates, and during principal discretionary release time. These meetings will allow the team to discuss project components, coordinate activities, and to develop and implement lesson plans. The team will develop a staff survey to determine grade-level needs, and to generate ideas for lesson plans, design elements, and project activities. The team will also develop the overall garden/habitat project plan, and determine a master schedule of activities and lessons needed for project implementation. Email exchanges and shared files will allow for collaboration in the assembly of a project data portfolio.