Colorado Front Range GK12 Connecting kids and ecology — teachers and researchers

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CLASSROOM INSTRUCTION

Fellows partner with teachers in the classroom to create lessons that teach foundations of ecology. Fellows help put content in the context of local ecology and bring in examples from university research. Teachers help fellows tailor lessons to age groups and content standards. This collaboration energizes teachers with fresh ideas and lessons, and helps fellows learn the art of teaching.

• GK-12 facilitates a sharing of information and resources, such as this entomology collection, between the University and local schools.
• Fellows can incorporate their own research expertise into classroom lessons. This means that both K-12 students and teachers get to learn up to date scientific information. They also get an opportunity to catch the infectious enthusiasm that the fellow has for his or her research.

• Experiential learning is integrated into the classroom.
• Science is used to teach English, Social Studies, and Math.
• GK-12 enables the purchase of research equipment to which students would otherwise not have access.

• Fellows and teachers work together to create lessons that feature local ecosystems and issues important to the ecology of the front range of Colorado. This photo shows students learning about ecology and disease by playing a food web game about elk.
• Students benefit from elaborate and interactive lessons because fellows are available to assist teachers with lesson preparation and execution.

AUTHENTIC OFF-SITE RESEARCH

Fellows help teachers to plan/design research projects that allow students to collect data in a real field setting. Students learn the importance of research protocols and planning, experience the realities of data collection, and analyze data to complete the experience.

• K-12 students conduct authentic research that is valuable to the scientific community. Some research projects could lead to publications in scientific journals.
• Research can be conducted by classes year after year and the data sets archived and used by subsequent classes, thus teaching students about the value of long-term research.
• Fellows help design research projects that are similar to their own thesis or dissertation work. Faculty advisors from the University also have input in the design of K-12 research.

• Research is often conducted at nearby sites, allowing students to return often to collect data.
• The Poudre River is accessible to most of our GK-12 schools. Many of the schools are doing similar and comparable research at different points along the river.
• Students study local resources with which they have a familiarity and in which they have a vested interest.

• Students can design their own research projects to answer questions that interest them. Fellows can connect these students with university researchers and resources that can help guide the students research.
• Assistance from fellows allows students to have more one-on-one guidance while conducting field research.
• Students are encouraged to share their research at science fairs and at the Colorado Front Range Student Ecology Symposium.

SCHOOLYARD PLOTS

Schoolyard plots are seen as an on-site teaching laboratory that can be accessed with ease and frequency. They provide the potential for elaborate long-term or short-term experiments. Schoolyard plots become part of the campus and a visible example of science research in the school community.

• Schoolyard plots can become integral parts of the school's campus and a visible example of science education at the school.
• GK-12 helps schools purchase and set-up equipment, such as weather stations, that can benefit all levels and types of science education at the school.

• Schoolyard plots allow students to conduct age-appropriate research and explorations. The photo shows elementary school students making science explorations in community garden.

• Schoolyard plots allow students to conduct research of local interest. The flow and regulation of water is very important in the arid west. This photo shows sixth grade Earth Science students using a miniature stream system to learn how land use and development along a stream affect erosion, sedimentation, slope stability, surface runoff, and water quality.
• Other schoolyard studies involve themes such as secondary succession and invasive plant species.

TEACHER-FELLOW PARTNERSHIPS

Teachers and fellows interact beyond the classroom walls. Teachers assist fellows with their research projects in the summer, fellows conduct workshops in ecology for small groups of teachers, and they partner on publications and presentations at meetings.

• Teachers can accompany and assist fellows with their thesis or dissertation research. This is a win-win situation because fellows get valuable assistance and teachers get research experience, continuing education credit, and a summer stipend.
• Teachers also learn specific research methods that they can take back to their classroom.

• Teacher-fellow partners attend scientific or education meetings together to communicate their ideas and research.
• Attending meetings prompts interdisciplinary connections and enhancement of science teaching because scientists attend education meetings and educators attend scientific meetings.
• By attending a conference of a different discipline fellows and teachers also learn more about the other discipline's culture and goals.

• Fellows prepare workshops for teachers. The photo shows teachers at a 3-day workshop about the life zones in Colorado.
• Teachers who participate learn new content and interact with teachers from other schools in the area.
• Workshop leaders enhance their knowledge of content and their teaching skills.

For more information about Colorado Front Range GK12, go to URL: http://www.nrel.colostate.edu/projects/gk12/

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