

Ten Things You Should Know About the Atmosphere

Connecting Research and K-12 Education

CMMAP, the Center for Multiscale Modeling of Atmospheric Processes, is devoted to bringing together a diverse community of scholars to work on a very complicated problem. But in addition to creating new ways of modeling the atmosphere, the Center is also spending significant time and energy exploring how this dynamic group can make an impact on K-12 education.

CMMAP is taking a research approach, partnering with organizations and individuals with experience and contacts in K-12 education to determine what students, schools and teachers need, and then developing curriculum, short courses and other tools to help K-12 educators better prepare the next generation of scientists.

Colorado State University's Little Shop of Physics program regularly visits schools all over the state and region to present a very popular hands-on science experience. This mobile program reaches underserved schools and communities, and a very diverse group of students. Teachers taking part in school programs have also participated in focus groups to see how CMMAP can best serve their needs and the needs of their students.



A teacher workshop at Wyoming Indian School

Two clear messages have come through: Teachers want to know more about basic science and the science of the atmosphere, and they want new and creative ways to make teaching these topics more engaging and effective. The Little Shop of Physics crew is working with CMMAP scientists to develop activities to meet both of these goals. Teachers taking part in a workshop titled "Ten Things You Should Know About the Atmosphere" deepen their understanding of some key concepts through hands-on exploration so they can better share them with their students. As they do so, they also learn simple, effective, low-cost means of doing hands-on lessons in their own classes. Each activity begins with an intriguing question, such as "If hot air rises, why is it cold in the mountains?" that gets participants thinking and asking questions. This is followed by exploration with simple tools (like a bike pump and a two liter bottle) that allow direct experience of the concepts at hand.



Training the next generation of scientists



An undergraduate intern works with a younger student



Making a cloud in a bottle at a teacher workshop

To date, the Little Shop has presented programs to over 15,000 K-12 students, and nearly 200 K-12 teachers have participated in workshops. Teachers are already doing activities with their classes that are based on what they have learned, and are eager for further lessons. In the coming years, CMMAP will continue to develop and disseminate new materials, traveling far and wide to present programs to teachers and students, developing not just new ways of modeling the atmosphere, but of modeling effective ways of teaching science to a diverse and changing audience of students who will be the scientists of the 21st century.