About EarthComm

This investigation will help you to:

Goals and Approach

Earth System Science in the Community (EarthComm) is an NSF-funded curriculum project guided in design and approach by the National Science Education Standards (1995), AGI's Earth Science Content Guidelines Grades K-12, and other major science education curriculum and reform programs. This program builds on the strength of other successful AGI earth science education projects such as the Earth Science Curriculum Project (known to many as Investigating the Earth). When complete, EarthComm will provide a comprehensive secondary-level educational program in the Earth Sciences that includes student learning materials, teacher resources (both materials and teacher-support networks), and assessment tools for a hands-on, inquiry-driven, instructional program. EarthComm does not cover as many topics as the traditional earth science textbook. It emphasizes important concepts, understandings, and abilities that all students can use to make wise decisions, think critically, and understand and appreciate the earth system. The goals of the EarthComm program are:

- To teach students the principles and practices of Earth science and to demonstrate the relevance of Earth science to their life and environment.
- To approach Earth Science through the problem-solving, community-based model in which the teacher plays the role of facilitator.
- To establish an expanded learning environment which incorporates field work, technological access to data, and traditional classroom and laboratory activities.
- To support the development of communities of learners by establishing student teams and by building a greater regional and national community through telecommunication access.
- To utilize local and regional issues and concerns to stimulate problem-solving activities and to foster a sense of Earth stewardship by students in their communities.

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Developing EarthComm

Hundreds of teachers, scientists, and students have helped produce EarthComm. In the summer of 1998, teams of Earth science educators wrote the original drafts of inquiry-based investigations. Chapters were reviewed and then pilot tested by 35 teachers in the spring of 1999. EarthComm underwent a national field test in the 1999-2000 school year.

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EarthComm "Big Ideas"

EarthComm curriculum development was guided by ten fundamental ideas that are emphasized in all units and are the primary goals for student learning:

- Earth science literacy empowers us to understand our environment, make wise decisions that affect quality of life, and manage resources, environments, and hazards.
- Earth's dynamic equilibrium system contains subsystems from atoms to planetary spheres. Materials interact among these subsystems due to natural forces and energy that flows from sources inside and outside of the planet. These interactions, changes, forces and flows tend to occur in off-setting directions and amounts. Materials tend to flow in chains, cycles, and webs that tend toward equilibrium states in which energy is distributed as uniformly as possible. The net result is a state of balanced change or dynamic equilibrium, a condition that appears to have existed for billions of years.
- Change through time produced Earth, the net result of constancy, gradual changes, and episodic changes over human, geological, and astronomical scales of time and space.
- Extraterrestrial influences upon Earth include extraterrestrial energy and materials, and influences due to Earth's position and motion as a subsystem of an evolving solar system, galaxy, and universe.
- The dynamic geosphere includes a rocky exterior upon which ecosystems and human communities developed and a molten interior with convection circulation that generates the magnetosphere and drives plate tectonics. It contains resources that sustain life, causes natural hazards that may threaten life, and affects all of Earth’s other geospheres.
- Fluid spheres within the Earth system include the hydrosphere, atmosphere, and cryosphere, which interact and flow to produce ever-changing weather, climate, glaciers, seascapes, and water resources that affect human communities, and which shape the land, transfer Earth materials and energy, and change surface environments and ecosystems.
- Dynamic environments and ecosystems are produced by the interaction of all the geospheres at the Earth’s surface and include many different environments, ecosystems, and communities that affect one another and change through time.
- Earth resources include the nonrenewable and renewable supplies of energy, mineral, and water resources upon which individuals and communities depend in order to maintain quality of human life, economic prosperity, and requirements for industrialization.
- Natural hazards associated with Earth processes and events include drought, floods, storms, volcanic activity, earthquakes, and climate change can pose risks to humans, their property, and communities. Earth science is used to study, predict, and mitigate natural hazards so that we can assess risks, plan wisely, and adapt to the effects of natural hazards.
- In order to sustain the presence and quality of human life, humans and communities must understand their dependency on Earth resources and environments, realize how they influence Earth systems, appreciate Earth’s carrying capacity, manage and conserve nonrenewable resources and environments, develop alternate sources of energy and materials needed for human sustenance, and invent new technologies.

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EarthComm Goals and Expectations for Teachers

- Use motivational teaching methods, interactive technologies, and manipulatives to pique student interest and help all students to understand the practical effects of Earth science and essential concepts and principles that underlie energy within the Earth system, geochemical cycles, and the origin and evolution of the Earth system.
- Facilitate students’ understanding of inquiry and ability to inquire scientifically by having students identify questions about local problems and issues, design and conduct investigations, use technology and mathematics, form scientific explanations using logic and evidence, analyze alternative explanations, and communicate and defend scientific arguments.
- Emphasize the connections and relationships between Earth science and other academic disciplines.
- Establish an expanded learning environment for students through fieldwork, technological access to data, laboratory and other classroom activities.
- Nurture communities of science learners by establishing student teams, orchestrating discourse about scientific ideas, building networks of local, regional and national information exchange, and using the services of Earth and space organizations.
  Raise students’ awareness of environmental and resource issues and problems in their communities.

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EarthComm Goals and Expectations for Students

- Develop knowledge and understanding of practical and essential Earth science concepts and the principles Earth science shares with other disciplines.
- Understand basic principles of Earth system science and think from an Earth system science perspective.
- Develop an understanding of scientific inquiry and abilities needed to conduct scientific inquiry.
- Develop technology-oriented abilities for human enterprises in Earth and space.
- Understand the nature, origin, and distribution of Earth’s energy, mineral, and water resources; technologies used to locate, extract, and process these resources; and dependency on these resources to satisfy our wants, needs, and expectations.
- Understand how terrestrial and extraterrestrial processes affect Earth’s materials, environments, and organisms, how scientists study these processes on Earth and from space, and how some processes benefit humans while others pose risks.
- Understand how human activities influence Earth’s spheres, processes, resources, and environments — factors that affect the size and distribution of human population and Earth’s capacity to support life.
  Become aware of career opportunities in the Earth and space sciences, how professions and businesses benefit from technologies used by Earth and space scientists, and how these combined professions and businesses are related to regional economies.

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