

DLESE Scope Statement

***SIMPLE Science* Collection, Center for Image Processing in Education (CIPE)**

CIPE Overview

CIPE is an independent nonprofit organization incorporated in 1992 as a spin-off of the successful Image Processing for Teaching (IPT) project of the Lunar and Planetary Laboratory at the University of Arizona. Under the direction of its board of trustees, CIPE promotes the use of visualization technologies for innovative educational and professional applications (more information about CIPE is available at <http://www.evisual.org>). Since 1992, CIPE has introduced K-14 educators to the use of image processing and analysis (IPA) and geographic information systems (GIS) as tools for learning about anatomy and physiology, astronomy, biology, biotechnology, chemistry, Earth and space science, environmental science, mathematics, and physics. CIPE disseminates instructional materials, conducts workshops for educators, and makes presentations at professional conferences. Recent funding for CIPE's projects has come from the National Science Foundation, National Aeronautics and Space Administration (NASA), National Institute on Drug Abuse (NIDA), National Geographic Society (NGS), and National Oceanic and Atmospheric Administration (NOAA).

Defining the *SIMPLE Science* Collection

The Simplified Image Management and Processing Learning Environment for Science (*SIMPLE Science*) is a two-year project, funded by the National Science Digital Library and the National Science Foundation. Its goal is to create a collection of online activities for science and mathematics education targeted toward middle school students. Of the 25 lessons, at least five will be focused on Earth and space science. All lessons are targeted at key national science and mathematics education standards.

The project was proposed as a contribution to the NSDL that would overcome barriers to mainstream use of image processing and analysis (IPA) in K-12 education. The system will (1) make IPA accessible to mainstream educators and the public as an easy to use tool for learning; (2) afford access by educators to extensive and updateable archives of imaging data; and (3) provide a pedagogical structure that helps educators use imaging data in a manner that supports attainment of specific national education standards.

Collection policy

Initially, all materials in this collection will be generated by CIPE. However, the project is developing a lesson generation system that could be used by outside developers to create materials for the collection. The *SIMPLE Science* project consists of a three-tiered structure that scaffolds students' use of IPA from basic explorations of how imaging is used in various fields of science to original research on data available from an archive created for *SIMPLE Science*. Tier 1 features tutorials that guide students through case studies replicating research conducted by leading imaging scientists and explaining key concepts in imaging science. Tier 2 features an online format using updated versions of CIPE's existing materials and new lessons based on CIPE's guided discovery approach. Tier 3 will provide a structure for students and teachers to conduct self-guided research using images from the *SIMPLE Science* archive and from selected Internet sources.

About 20 percent of the activities focus on Earth and space science, and those are the ones CIPE is submitting to the DLESE collection. Topic areas of these resources include:

- (a) monitoring snow/ice cover (global warming),
- (b) tracking hurricanes,
- (c) measuring the ozone hole,
- (d) comparing planet size, and
- (e) creating true- and false-color maps using multispectral data.

Contact information

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Resource terms of use

All the materials in *SIMPLE Science* are directly developed, and the copyright of all the resources resides with CIPE, unless otherwise indicated in the metadata record of the individual resources themselves.

Metadata terms of use

The metadata for *SIMPLE Science* is copyrighted by CIPE. However, DLESE may modify, reformat, and redistribute the metadata to function within DLESE systems and services.

Resource quality assurance

Although the funding for *SIMPLE Science* will end in 2006, CIPE will continue to ensure the integrity of the collection in order to maintain its scientific accuracy, significance to teachers, pedagogical effectiveness, completeness of documentation, ease of use for both teachers and learners, and robustness as a digital resource.

Metadata quality assurance

Because all the resources within the *SIMPLE Science* collection are directly developed, CIPE staff will continue to ensure the quality of both the resources and the metadata. The metadata records are generated by hand and double-checked before submission.

Persistence

The anticipated life of the collection is five to ten years. After cessation of NSF funding, the *SIMPLE Science* collection will be evaluated annually to determine its relevance for K-12 and public education. Economic strategies for sustaining the collection (e.g., marketing CD-ROM or DVD-ROM products based on the collection and application for additional funding to extend the collection) will be implemented.