

Hands-On Universe

Publisher: Lawrence Hall of Science

Developer: Lawrence Hall of Science, TERC, Adler Planetarium, and Yerkes Observatory

Grade levels: 9–12

Scientific domains: Astronomy, physics, earth science

Web site:

<http://www.handsonuniverse.org>

Year profiled: 2002

Hands-On Universe (HOU), developed in 1999, is a high school-level curriculum that enables students to use high-quality astronomical images to explore science, math, and technology concepts, specifically the solar system, galaxies, variable stars, and supernovae. The program uses print materials, CD-ROM, and Internet. Students request their own observations from professional observatories and download telescope images to their classroom computers. They also use image-processing software to visualize and analyze their data. Students master problem-solving techniques and critical-thinking skills throughout the investigations.

SCOPE/CONTENT

The *HOU* program is presented through seven theme-based booklets, each on a different astronomical technique:

- Introduction to Image Processing
- Finding Features
- Supernovae Search
- Measuring Size
- Measuring Brightness
- Measuring Distance
- Measuring Color

Each theme contains discussion sheets, curriculum units, and supplementary activities. The discussion sheets provide explanations of new concepts and equations; the units introduce basic techniques for the software and images (including investigations and challenges); and the supplementary activities include enhancement, enrichment, and alternative activities.

FORMAT

The program includes the seven theme booklets, a CD-ROM, and special image-processing software. Teacher Notes are provided with each theme, and image lists and materials lists are included to help with preparation. Images for each theme booklet are available after the software from the CD is installed. Teachers should make sure the computer is ready to go before the start of class.

ASSESSMENT INSTRUMENTS

Various activities for follow-up and skills assessment are suggested throughout the theme booklets. Some apply to specific units or activities, while others examine overall understanding of the theme itself. A checklist of skills and concepts is also included to assist the teacher in evaluating student progress.

PROFESSIONAL DEVELOPMENT SUPPORT

The *HOU* program offers a number of professional development opportunities for the teacher, including a five-day training program and a one-day teacher workshop.

STAND-ALONE VS. SUPPLEMENTAL

The curriculum can be used as a core astronomy course or as 8- to 12-week modules to supplement a physics, earth science, or physical science program.