

## **Hubble Space Telescope Deep Field Activity 1**

<http://amazing-space.stsci.edu/resources/explorations/hdf/index.html>

### ***Suggested Modifications for Mildly Educationally Disadvantaged Students***

**Created By: Ms. Dorian Janney, Forest Oak Middle School - Math 6th grade, Science 7th & 8th grades and JPL "Solar System Ambassador"**

Intended grade levels: 6 through 8

Modifications useful for mildly educationally disadvantaged students who may experience learning disabilities, speech and language delays, developmental delays, behavioral/emotional difficulties, are English Speakers of Other Languages (ESOL/ESL), have ADD/ADHD or other "504 plan" difficulties, are culturally disadvantaged, and/or experience difficulties grasping concepts and content at grade-appropriate levels.

In this activity, the students practice estimation skills as they begin to explore the Hubble Deep Field image. They give rough estimates of number of objects in the image. Then they use representational sampling techniques to improve estimates. Finally, they transfer this information to gain an understanding of how astronomers have determined the range of similar objects in the known universe using the Hubble Deep Field camera images.

Suggested lesson modifications include:

- ❖ Using concrete examples before moving to abstract level
- ❖ Initiating directed group discussion to assist in developing background information and leading to defining key terms
- ❖ Group sharing of possible answers to questions to assist students with less background information, confidence, ability, etc...
- ❖ Directed group discussions to assist students in transferring information to other settings
- ❖ Multi-sensory approach- includes visual, auditory, and kinesthetic input and output
- ❖ Task-analyzed sequence of written activities with scaffolding to limit impact of organizational and perceptual-motor problems
- ❖ Lesson organized in predicable "Five E" format
- ❖ Visual information presented clearly and concisely (projector works best)
- ❖ Many opportunities to practice transferring information to new settings