



The White Glove Test

Lesson Summary

In this lesson, students explore the SDC data interface to establish any trends in the dust distribution in the Solar System. Students record the number of dust particles, "hits," recorded by the instrument and the average mass of the particles in a given region.

Prior Knowledge and Skills

- Knowledge of Astronomical Units (AU's)
- Scientific notation

AAAS Science Benchmarks

The Physical Setting

The Universe

NSES Science Standards

Science and Technology

Understandings about science and technology

Earth and Space Science

Origin and evolution of the Earth system

Teaching Time: 1 50-minute period

Materials

Access to the Internet

Advanced Planning

Preparation Time: ~10 minutes

Familiarize yourself with the SDC New Horizons website at

<http://lasp.colorado.edu/sdc>

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Discovering Dust in the Solar System: Educator Guide

In this activity, students use the Student Dust Counter data interface to determine the dust concentration at several different locations in the solar system. In this version, we suggest six different segments of New Horizons' path. As New Horizons continues in its journey, this activity will be supplemented with additional path suggestions.

Skills used

Accessing and interpreting data

Presenting results to peers

Quantitative analysis

Procedure

- Break the class up into small groups (4 or 5 students per group, for a maximum of 6 groups).
- Point each group to the SDC web site, <http://lasp.colorado.edu/sdc>. You may wish to let them spend some time perusing the site before beginning the data activity.
- Distribute the “White Glove Test” student worksheets and ask the groups to complete Parts I - IV. The prompts have been kept deliberately open-ended to encourage independent exploration of the data.
 - Part I: Here students analyze the number of hits recorded by the SDC. They may find that the SDC encountered a uniform distribution of dust during its journey, that the dust concentration trended in a particular direction (e.g. denser closer to the sun), or that the instrument found unusually dense (or vacant) pockets of dust. Students may discover that no discernable trend exists.
 - Part II: Here students consider the mass of dust particles hitting the SDC detectors. They review the data looking for the same kind of trends they observed in Part I. (“e”= 10 “to the power of”)
 - Part III: Now, students are asked to sketch the solar system and annotate the sketch with information about their observations from Parts I and II. Encourage students to consider how their results might be related to the “geography” of the solar system—distance from the Sun, proximity to planets, etc.

After about 20 minutes, bring the groups together and have them share their results. You may wish to record their results on the board. As a class, answer the questions posed in Part V.