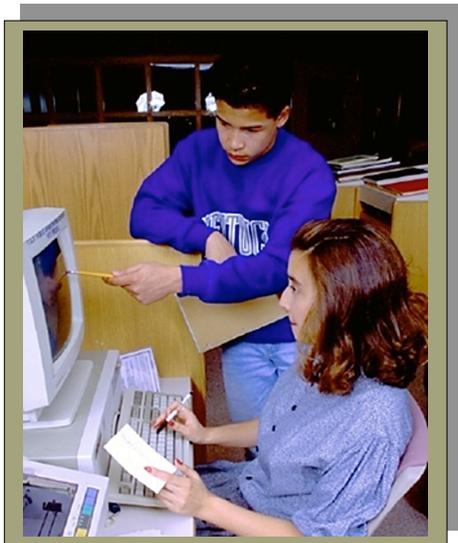


High Power Activity

Deep Impact will be the first NASA Discovery mission to make a spectacular football stadium-sized crater, 7-15 stories deep, into a speeding comet. Dramatic images from both the flyby spacecraft and the impactor will be sent back to distant Earth as data in near-real time.

During the planning phase of a mission, there are many decisions that need to be made about how to best meet the mission objectives. This activity gives students an opportunity to model a decision-making process similar to one that was made for the Deep Impact mission. It is labeled “High Power” because the activity—much like the high-power magnification through the lens of a microscope—focuses on an extensive unit of study, or education module, called [Collaborative Decision Making: NASA’s Deep Impact Mission](#).

The following classroom materials are available in Portable Document Format (PDF) for your browsing and printing convenience. The files are print-optimized, and should be printed to achieve maximum resolution. Adobe's new Acrobat Reader 4.0 is required to view and/or print. To install the FREE reader, visit the [Adobe Web site](#).



High Power Activity

This activity is designed to engage students in grades 8–12 in activities that focus on collaboration and communication strategies. Students confront a simple issue of whether the mission should place an additional digital camera(s) onboard the spacecraft. Students research and debate the scientific and technological aspects of placing an additional camera(s) on board the Deep Impact spacecraft.

These activities will strengthen student understanding of and ability to use collaborative processes and communication practices to clarify, conceptualize, and make decisions. The strategies rely primarily on student investigation into the background information that is necessary to support arguments; make quantitative risk analyses; engage in debate, role-playing, and persuasive writing/communication processes; and practice group decision-making procedures.

High Power

- [Teacher Guide](#)

Decision Making

- [Student Activity](#)
- [Proposal for Optional Onboard Public Viewing Camera](#)

This activity begins by eliciting students’ prior knowledge about how they have made decisions in the past. In “Capture the Issue,” students are introduced to a problem that mission planners dealt with during the planning phase of the mission. Students read about the problem, in the “Camera Controversy.”

Students use the “[Discussion Web](#)” graphic organizer to help students brainstorm both sides of the issue, determine what additional information is needed to make a decision, and organize their argument.

More information is provided in the form of a “[Proposal for Optional Onboard Public Viewing Camera](#).” This proposal is similar to the one received by NASA for the Deep Impact mission.

Student Presentation Guide

- [Defend This!](#)
- [Public Forum Role Sheets](#)

Student Text

- [Communicating, Questioning, and Listening](#)

Assessment Guide

- [Critiquing Ideas](#)

Graphic Organizer

- [Decision-Making Process](#)

Students gather information about comets in general and specifically about mission and science objectives of NASA's Deep Impact spacecraft.

Students assume roles of various stakeholders of the mission including scientists, engineers, and the interested public such as environmentalists, politicians, teachers, students, and others. General guidelines are provided for students to follow for each role, though they are encouraged to build the character of the person they are role-playing. Students will use the information from the Student Presentation Guide, "[Defend This!](#)," in order to present their ideas for science team and public review. During the presentations, students complete critiques of the groups' performance and quality.

Once all of the presentations have been completed, students consider how the mission team should make a decision about whether or not an additional camera(s) should be placed on this spacecraft.

Curriculum Connections
National Science Standards Addressed

Grades 5-8, 9-12

Science and Technology

- Understandings about Science and Technology

History and Nature of Science

- Science as a Human Endeavor
- Nature of Science

Science in Personal and Social Perspectives

- Science, Technology and Society

Language Arts Standards Addressed

Grades 6-8

Listening and Speaking

Life Skills Standards Addressed

Grades 6-8

Thinking and Reasoning

Behavioral Studies Standards Addressed

Grades 6-8

Understands conflict, cooperation, and interdependence among individuals, groups, and institutions

This education module, *High Power Activity*, was developed by educators at [Mid-continent Research for Education and Learning](#).

