



Astronaut Susan L. Still in the Spacelab Module during a mission aboard the Space Shuttle Columbia.

their own observing or communication satellites in Earth orbit. Observing Earth has provided G.P.S.,³ meteorological forecasts, predictions and management of hurricanes and other natural disasters, and global monitoring of the environment, as well as **surveillance** and intelligence. Satellite communications have changed life and business practices with computer operations, cell phones, global banking, and TV. Studying humans living in the microgravity⁴ of space has expanded our understanding of osteoporosis and balance disorders, and has led to new treatments. Wealth-generating medical devices and instrumentation such as digital mammography and outpatient breast biopsy procedures and the application of telemedicine to emergency care are but a few of the social and economic benefits of manned exploration that we take for granted.

surveillance:

Space exploration is not a drain on the economy; it generates infinitely more wealth than it spends. Royalties on NASA patents and licenses currently go directly to the U.S. Treasury, not back to NASA. I firmly believe that the Life Sciences Research Program would be self-supporting if permitted to receive the return on its investment. NASA has done so much with so little that it has generally been assumed to have had a huge budget. In fact, the 2007 NASA budget of \$16.3 billion is a minute fraction of the \$13 trillion total G.D.P.⁵

³ **G.P.S.:** an abbreviation for Global Positioning System, a system for determining one's position on Earth by comparing radio signals received from different satellites placed into orbit by the United States Department of Defense (DOD).

⁴ **microgravity:** also called *zero gravity* or *weightlessness*, microgravity is the near absence of gravity.

⁵ **G.D.P.:** an abbreviation for Gross Domestic Product, the total market value of all the goods and services that are produced inside a country during a specified period.

4. **◀ REREAD AND DISCUSS ▶** With a small group, discuss whether the evidence Vernikos cites to defend the cost of space exploration is sufficient (lines 48–55). Cite text evidence in your discussion.

5. **▶ READ ▶** Read lines 56–67. Underline the opposing viewpoint Vernikos references, and restate it in the margin.



legitimate:

“What’s the hurry?” is a **legitimate** question. As the late Senator William Proxmire said many years ago, “Mars isn’t going anywhere.” Why should we commit hard-pressed budgets for space exploration when there will always be competing interests? However, as Mercury, Gemini and Apollo did 50 years ago, our future scientific and technological leadership depends on exciting creativity in the younger generations. Nothing does this better than manned space exploration. There is now a national urgency to direct the creative interests of our youth towards careers in science and engineering. We need to keep the flame of manned space exploration alive as China, Russia, India, and other countries forge ahead with substantial investments that challenge U.S. leadership in space.

6. ◀ **REREAD** Reread lines 56–67 and continue to cite text evidence.
- Underline the counterargument Vernikos addresses.
 - Then circle the pieces of evidence you find most convincing.
 - Make notes in the margin to justify your choices.

SHORT RESPONSE

Cite Text Evidence Explain whether or not Vernikos convinced you that space exploration is worth the cost. Review your reading notes, and evaluate the strength and reasonableness of the claims and evidence offered. Be sure to **cite text evidence** from the essay in your response.
