

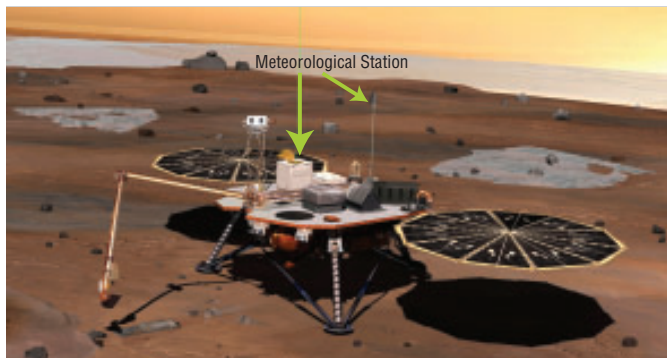
## Should Canadians Be Paying for Space Research?

Is there life on Mars? Scientists have been researching this question for decades. In 2008, Canadian researchers contributed to a successful mission to Mars called *Mars Phoenix*. This space probe was designed to hunt for signs of water and the presence of microbial life.

Canadian scientists were responsible for designing and building *Phoenix's* meteorological station (MET), dedicated to recording the daily weather on Mars (Figure 1). This information helps us understand how the surface of Mars has changed over time. Scientists at York University in Toronto oversaw the development of the instruments, designed to measure the wind, temperature, pressure, and atmospheric conditions on Mars. The CSA contributed funds for the project, and private Canadian companies, such as Optech, and MacDonald, Dettwiler and Associates, built the MET.

Since the CSA is a government organization, it paid for the mission with money collected from Canadian taxpayers. In total, the CSA spent \$37 million on the MET.

*Mars Phoenix* was launched on August 4, 2007, and landed near the Martian North Pole on May 25, 2008. The probe collected data on the surface of Mars for over five months before powering down. This was much longer than mission scientists predicted. The Canadian-built MET was successful in creating the first profile of an extraterrestrial atmosphere. *Mars Phoenix* confirmed that Mars has ice just below the surface, a sign that life may have existed in the past.



**Figure 1** The meteorological station on the *Mars Phoenix* lander was paid for and created by the CSA. Was it worth the money?

### The Issue

Because of our strong space program and a long history of Canadian discoveries in astronomy, Canada is known to scientists as one of the best countries in which to perform research in astronomy and space science. However, to remain a world leader, the Canadian government must continue to spend money on research and development. Some people believe that it would be better to spend taxpayer money on other things, such as health care and education.

As a consultant hired by the Canadian government, you must research the benefits and drawbacks of spending money on space exploration projects such as the *Mars Phoenix* MET. You will report back with a decision on whether to continue investing money in such programs.

### Goal

To create a pamphlet, website, written report, or electronic presentation designed to summarize your findings on the benefits and drawbacks of spending money on space science research in Canada.

### Gather Information

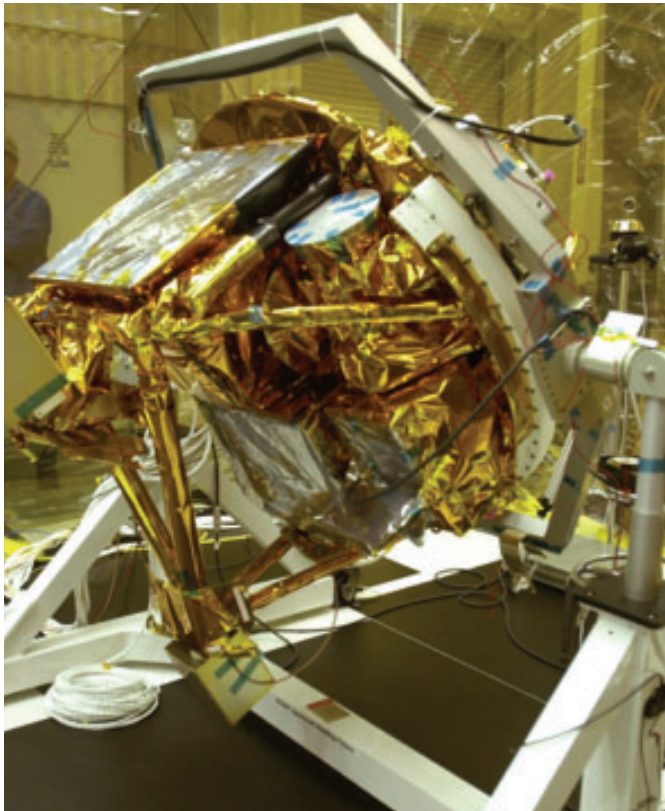


You will need to research the ways the CSA has partnered with Canadian companies, government agencies, and universities for different space projects. You can focus on the recent success of the CSA in exploring Mars or identify other projects Canadian scientists are involved in, such as the following:

- RADARSAT-1 or -2
- MOST
- DEXTRE
- SCISAT-1 (Figure 2 on the next page)
- Canadarm
- International Space Station



GO TO NELSON SCIENCE



**Figure 2** SCISAT measures and studies the processes that control the distribution of ozone in Earth's atmosphere.

Before you decide on a recommendation for the Canadian government, you need to research more about the other financial responsibilities the Canadian government has.

- Where else could the government spend the money they would normally spend on space science research?
- What other areas do people think the government should spend money on?

In addition, you might want to conduct a survey to learn what the public's opinion is on the issue of funding for space research. You may consult your classmates, teachers, or family members.

## Identify a Solution

For the project you have chosen, answer the following questions:

- How has the project been a benefit to the field of space exploration?
- How has the project been a benefit to society in general?
- What negative effects has the project had on society, and could there be any negative effects in the future?
- How much has been spent by the CSA on this type of research?
- In what ways does the government stand to make money from its investment in Canadian space science research?
- What kinds of costs might there be for investing in future research projects like this?
- What benefits might there be for investing in future research projects like this?

## Make a Decision

Decide whether you will recommend to the Canadian government to continue funding the CSA at current levels or to increase or decrease the amount of money spent on space research.

## Communicate



Create your presentation and share it with your classmates in small groups. Some of your classmates might have different opinions concerning your recommendation to the government. Consider their points of view and listen to their arguments carefully. Your teacher might set up a formal debate so you can listen to all the issues.

When you present your recommendation, be sure to support your position using facts. If you are presenting the results of a survey, make sure you present your findings in an appropriate format, such as a graph. **T/I C A**