Name _____ Date _____ Class _____

TECHNOLOGY NOTE

Robot in the Hot Seat

Scientists have to be calm, cool, and collected to study active volcanoes. But the recently cooled magma in a volcanic crater isn't the most hospitable location for scientific study. What kind of daredevil would run the risk of creeping along a crater floor? A volcanologist like *Dante II,* that's who!

Hot Stuff

A volcano crater may seem empty after a volcano erupts, but it is in no way devoid of volcanic information. Gases hissing up through the crater floor give scientists clues about the molten rock underneath, which may help them understand how and why volcanoes erupt repeatedly. But these gases may be poisonous or scalding hot, and the crater's floor can crack or shift at any time. Over the years, dozens of scientists have been seriously injured or killed while trying to explore volcano craters. Obviously, volcanologists needed some help studying the steamy abyss.

Getting a Robot to Take the Heat

Enter *Dante II,* an eight-legged robot with cameras for eyes and computers for a brain. In 1994, led by a team of scientists from NASA, Carnegie Mellon University, and the Alaskan Volcano Observatory, *Dante II* embarked on its first mission. It climbed into a breach called Crater Peak on the side of Mount Spurr, an active volcano in Alaska. Anchored at the crater's rim by a strong cable, *Dante II* was controlled partly by internal computers and partly by a team of scientists. The team communicated with the robot through a satellite link and Internet connections. *Dante II* moved very slowly, taking pictures and collecting scientific data. It was equipped with gas sensors that provided continuous readings of the crater gases. It performed the tasks human scientists could not, letting the humans keep their cool.

Mission Accomplished?

During its expedition, *Dante II* encountered large rocks, some of which were as big as the robot itself. In addition, while climbing out of the volcano, *Dante II* slipped and fell, damaging one of its legs. Eventually *Dante II* had to be rescued by helicopter because its support cable broke. Despite these obstacles, *Dante II* was able to gather valuable data from the volcano's crater.

Dante II's mission also met one of NASA's objectives: to prove that robots could be used successfully to explore extreme terrain, such as that found on planetary surfaces. *Dante II* paved the way for later robotic projects, such as the exploration of the surface of Mars by the *Sojourner* rover in 1997.

Write About It

Write a proposal for a project in which a robot is used to explore a dangerous place. Don't forget to include what types of data the robot would be collecting.