Sine Wave Science

NOVA Activity **Volcano's Deadly Warning**

Some volcanic eruptions have been accurately predicted by looking at the complex sine waves created by small earthquakes within volcanoes. But what is a complex sine wave? Find out in this activity.

Procedure

1. Acquaint yourself with how to combine two simple sine waves to create a complex wave by reading the *About Sine Waves* activity sheet.

2. You will now combine two simple sine waves to create a complex wave. Using your *Combining Sine Waves* activity sheet, add the amplitudes for sine waves 1 and 2 on each vertical graph line and mark the result on the complex sine wave baseline.

3. Plot your complex sine wave points to the end of the wave's baseline. When you have plotted the points, connect them with a smooth curving line.

Questions
Write your answers on a separate sheet of paper.

1. What is the wavelength of sine wave 1? What is the wavelength of sine wave 2?

2. Does your complex wave repeat itself? If so, what is its wavelength?

3. Examine the wavelengths of sine waves 1 and 2. Is there a mathematical relationship between their wavelengths and the complex wave's wavelength? If so, what is that relationship?