

Chapter 11

Use with Section 2

ENRICHMENT

● **Seafloor Spreading****Tomography**

Read the information and answer the questions.

Have you ever heard of a CAT scan? Perhaps you know someone who had a CAT scan in the hospital. The letters **CAT** stand for “computerized axial tomography.” A CAT scan uses radioactive particles to give a three-dimensional picture of a body part.

TTT is another kind of tomography. Instead of using X rays, TTT (travel-time tomography) uses the speed of seismic waves to find new information about Earth’s structure. Seismic tomographers study records of thousands of earthquakes that are recorded all over the world. They also use explosions, blasts of air, and vibrators to create waves that can be traced and timed. The path of sound waves generated between Antarctica and Australia may be detected by equipment set up as far away as San Francisco and Canada.

By recording the speed of such waves, the scientists can tell if the waves have traveled through solid or liquid areas. They can also tell if the material through which the waves travel is warm or cool. Using this new technology,

tomographers have measured differences in the density of Earth. They have discovered that Earth’s core, mantle, and crust are much more complicated than scientists used to think.

Tomography could not work without computers. Only a computer could keep track of the thousands of seismic waves that must be measured in tomography.

What are some of the projects tomographers are planning? A team of oceanographers thinks that TTT can help answer a question you probably hear often: Is Earth really getting warmer? However, they do not expect TTT to answer the question very soon. They would have to compare the results of many tests over a period of many years.

Another important project will investigate convection currents under Earth’s crust. Some scientists think that convection currents move in huge circles all the way down to Earth’s core. Others think that they stop about 700 km down. The tomographers hope that TTT will help them end the debate.

- How are CAT scans and TTT alike? _____

- You have learned that heat creates convection currents in water. What is in Earth’s layers that could create a convection current? What layers of Earth may move in the way the water moves?

- Which of the two projects do you think would affect people throughout the world most directly?

