

## CONTENT BACKGROUND:

### The Earth's Plates

Most earthquakes are caused by movements of the Earth's lithospheric plates and occur at the boundaries between the plates. Earth scientists recognize seven to twelve major plates and a number of smaller ones. The plates take their names from continents (the North American plate), from oceans (the Pacific plate), and from geographic areas (the Arabian plate).

During the 20<sup>th</sup> century, improvements in seismic instrumentation and greater use of earthquake-recording instruments (seismographs) worldwide enabled scientists to learn that earthquakes tend to be concentrated in certain areas. Most earthquakes and volcanic eruptions do not strike randomly but occur in specific areas, such as along plate boundaries. One such area is the circum-Pacific *Ring of Fire*, where the Pacific Plate meets many surrounding plates. The Ring of Fire is the most seismically and volcanically active zone in the world.

Many major population centers are located near active fault zones, such as the San Andreas. When an earthquake occurs along these zones, millions of people can suffer personal and economic losses. Not surprisingly, some people believe that, when the "Big One" hits, California will suddenly "break off" and "fall into the Pacific," or that the Earth will "open up" along the fault and "swallow" people, cars, and houses. Such beliefs have no scientific basis whatsoever. Continents do not float in the ocean and cannot fall since they are on large slabs of rock called tectonic plates.

Mid-plate earthquakes - those occurring in the interiors of plates – are much less frequent than those along plate boundaries and more difficult to explain. Earthquakes along the Atlantic seaboard of the United States are most likely related in some way to the westward movement of the North American Plate away from the Mid-Atlantic Ridge, a continuing process begun with the break of the Pangaea. However, the causes of these infrequent earthquakes are still not understood.

Information from *This Dynamic Earth: the Story of Plate Tectonics* by W. Jacquelyne Kious and Robert I. Tilling, distributed by U.S. Department of the Interior / U.S. Geological Survey