Kobe earthquake

Figure 1 Map of Japan

On January 17th, 1995, Japan was woken at 5:46am by its largest ever recorded earthquake. The Great Hanshin Earthquake measured 7.2 on the Richter scale and lasted over 20 seconds. According to official statistics, 5,472 people were killed, and over 400,000 were injured. Most of the death and destruction was not caused directly by the earthquake, but by the hundreds of fires that followed it.

What causes the earthquake?

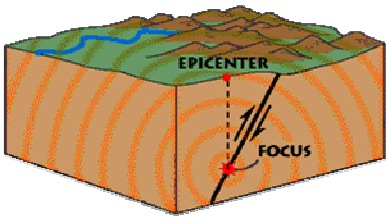
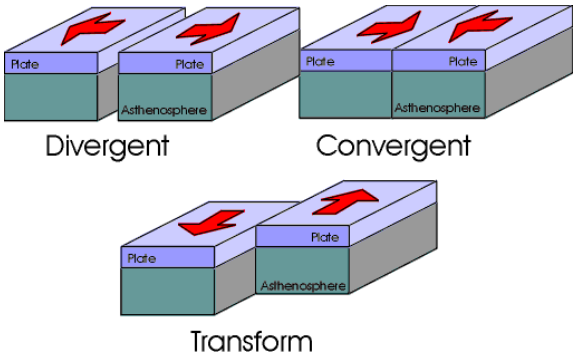


Figure 2 Earthquake key terms

Earthquakes are usually caused by the movement of the earth's tectonic plates. Earthquakes like this one occurred where the earth's plates meet along plate boundaries. For example as two plates move towards each other, one can be pushed down under the other one into the mantle. If this plate gets stuck it causes a lot of pressure on surrounding rocks. When this pressure is released it produces shock waves. These are called seismic waves. This is an earthquake. The waves spread out from the point where the earthquake started - the focus. More damage is done near the focus. The point on the earth's surface directly above the focus is the epicentre. This is what happened to the city in Tokyo. The plate shifted causing an earthquake.



Types of plate movement

As I explained before, earthquakes are caused from the collision of plates thus creating shockwaves. The collision of plates is called plate movements and there different types of plate movement. The two types of plate movement is Convergent and divergent and there are different types of convergent and divergent plate movements. The Kobe earthquake is a oceanic-continental convergence plate movement (figure 1 on the side shows different plate movement). Compared to a continental-continental convergence plate movement, the environment effects are more noticeable in a continental-continental convergence plate movement. However there has not been a continental-continental convergence plate movement for several centuries. An example of a continental-continental convergence plate movement is the collision of India into Asia 50 million years ago which caused the Eurasian Plate to crumple up and override the Indian Plate. After

the collision, the slow continuous convergence of the two plates over millions of years pushed up the Himalayas and the Tibetan Plateau to their present heig hts.

Why did the earthquake happened here?

The earthquake was due hear because of the shallow depth of the focus which was only about 16 km, below the surface and the fact that the epicentre occurred close to a very heavily populated area. Seismic shockwaves travelled from Awaji Island (the epicentre) along the Nojima Fault to the cities of Kobe and Osaka. Additionally Kobe lies close to the borders of two plate boundaries. Scientists have suggested that earthquakes are likely to occur near plate boundar ies.

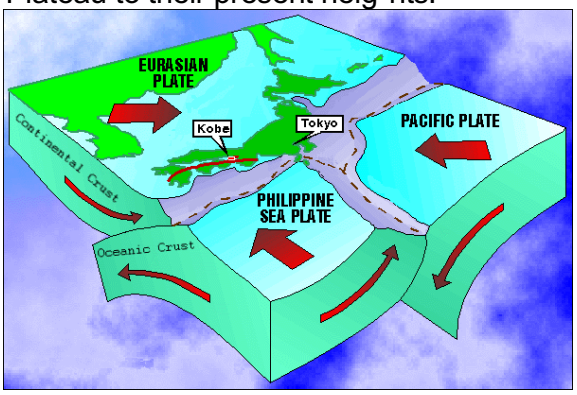


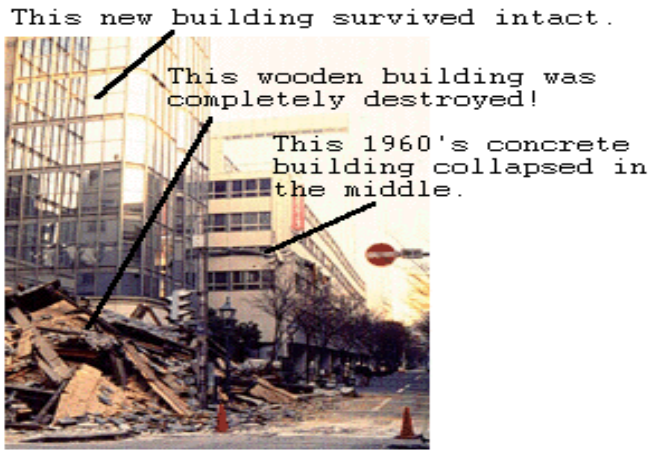
Figure 3 shows the direction of the seismic waves and how the plates moved

The Effects of the Earthquake:

The effects can be divided into primary and secondary effects. Primary effects included the collapse of 200,000 buildings, the destruction of 120 of the 150 quays in the port of Kobe, and fires which raged over large p ortions of the city. Secondary effects included disruption of the electricity supply. Residents were afraid to return home because of aftershocks that lasted several days (74 of which were strong enough to be felt).

Figure 4 Environmental effect of the earthquake

Social



Local hospitals struggled to keep up with demand for medical treatment, largely due to collapsed or obstructed "lifelines" (roads) that kept supplies and personnel from reaching the affected areas. People were forced to wait in corridors due to the overcrowding and lack of space. Some people had to be operated on in waiting rooms and corridors.

Approximately 1.2 million volunteers were involved in relief efforts during the first three months following the earthquake. Comparing to the LEDC the local response

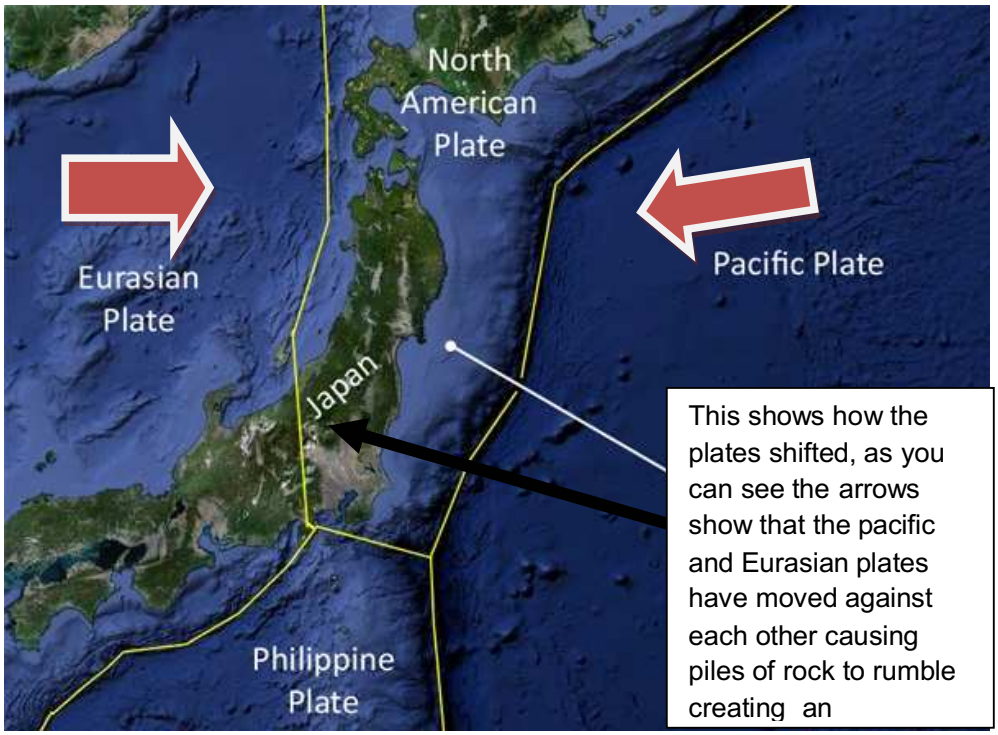
unit was superior because of the public services that are available e.g. fire brigade. Moreover LEDC's buildings are very cheaply built when compared to Kobe's building. The national government of Japan led by Prime Minister Tomiichi Murayama was criticised for not acting quickly enough to save many people, for poorly managing Japanese volunteers, and for initially refusing help from foreign nations, including the United States, South Korea, Mongolia, and the United Kingdom. A local resident states that "This earthquake was horrifi c I can't believe this! I lost my wife..." and many other citizens have lost families etc.

Economicals

The earthquake caused approximately ten trillion yen or $102.5 billion in damage. Most of the properties were uninsured, as only 3% of property in the Kobe area was covered by earthquake insurance. The sheer size of the earthquake caused a major decline in Japanese stock markets and factories were destroyed thus people in the neighbourhood had to search for work. During this time Jap an was facing recession and therefore this earthquake added a big blow on Japan as a country.

Environmental

Earthquake effects include waste and air pollution and landfill disposal. About 20 million tons of waste was emitted. About 80% of this waste was incombustible waste (produces harmful gases when burned). Out of the 80%, 70% was concrete and mortar and the rest was steel frames and aluminium sashes. Combustibles, which occupied about 20%, consisted of wood, paper and plastics. Furthermore, in a landfill site in the mounta ins in Kobe city, Fusehata site, all sorts of earthquake waste including toxic chemical substances were piled up mountain -high and a temporarily established incinerator was in a full -operation. A great amount of asbestos was left in bags. There was no envi ronment-protection such as rubber sheeting in the Fusehata site.



This shows how the plates shifted, as you can see the arrows show that the pacific and Eurasian plates have moved against each other causing piles of rock to rumble creating an