

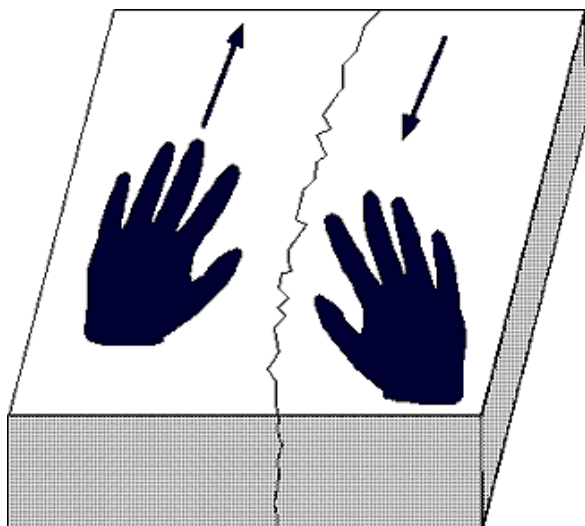
UPSeis

an educational site for budding seismologists

Why Do Earthquakes Happen?

Earthquakes are usually caused when rock underground suddenly breaks along a fault. This sudden release of energy causes the seismic waves that make the ground shake. When two blocks of rock or two plates are rubbing against each other, they stick a little. They don't just slide smoothly; the rocks catch on each other. The rocks are still pushing against each other, but not moving. After a while, the rocks break because of all the pressure that's built up. When the rocks break, the earthquake occurs. During the earthquake and afterward, the plates or blocks of rock start moving, and they continue to move until they get stuck again. The spot underground where the rock breaks is called the **focus** of the earthquake. The place right above the focus (on top of the ground) is called the **epicenter** of the earthquake.

Try this little experiment:



1. Break a block of foam rubber in half.
2. Put the pieces on a smooth table.
3. Put the rough edges of the foam rubber pieces together.
4. While pushing the two pieces together lightly, push one piece away from you along the table top while pulling the other piece toward you. See how they stick?
5. Keep pushing and pulling smoothly.

Soon a little bit of foam rubber along the crack (the fault) will break and the two pieces will suddenly slip past each other. That sudden breaking of the foam rubber is the earthquake. That's just what happens along a strike-slip fault.

Earthquake-like seismic waves can also be caused by explosions underground. These explosions may be set off to break rock while making tunnels for roads, railroads, subways, or mines. These explosions, however, don't cause very strong seismic waves. You may not even feel them. Sometimes seismic waves occur when the roof or walls of a mine collapse. These can sometimes be felt by people near the mine. The largest underground explosions, from tests of nuclear warheads (bombs), can create seismic waves very much like large earthquakes. This fact has been exploited as a means to enforce the global nuclear test ban, because no nuclear warhead can be detonated on earth without producing such seismic waves.

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