

# Earthquake-resistant Buildings

The Earth's crust is made up of **tectonic plates**. Sometimes when plates move past each other they get stuck and **friction and pressure** build up. When the friction and pressure are released the **ground shakes**, making an **earthquake**.

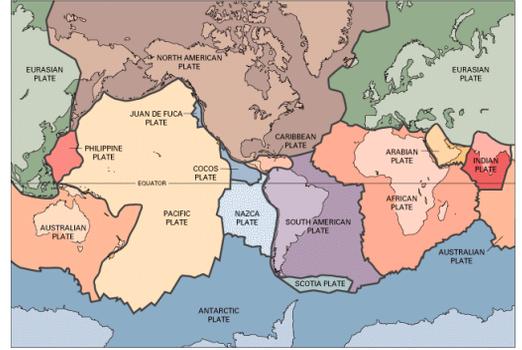


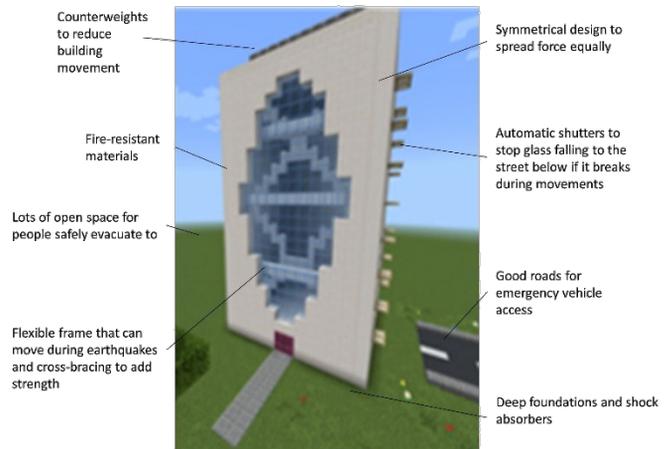
Image: USGS (public domain)

Earthquakes can be very **dangerous**.

- many people have **died** or been **injured** due to buildings collapsing
- **fires** can break out if gas pipes are broken
- people also often **lose their homes** and possessions.

So that people can move safely away during earthquakes, buildings need **lots of open space** around them.

**Flexible** materials help the building sway and not crumble. **Fire-resistant** materials reduce the risk of fire.



Base image: Jay Fenney

The foundations are deep to help protect the building too.

This [video](#) shows engineers using a **shake table**, which shakes to test how earthquake-resistant the building on it is.

Could you make your own, with card on top of pens in a box?



Image: [FASHIONSAP.COM](https://www.fashionsnap.com). Used with permission.

Fa-bo, an office building in Japan, has **carbon-fibre cables** connecting the roof of the building and the ground. If an earthquake hits, the cables stretch and pull in the opposite direction to the shaking, keeping the building standing.

Concrete is heavy and can't change its structure when stretched, and so can break during earthquakes.

Cardboard and wood structures used in Christchurch's cardboard cathedral are naturally more earthquake-resistant.

They are **flexible and strong** when stretched and absorb energy when they collapse.



Image: AlasdairW, [CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0), via Wikimedia Commons. <https://creativecommons.org/licenses/by-sa/3.0>

## Minecraft challenge

Can you build an **earthquake-resistant building** in Minecraft?

You could use:

- some of the building techniques we have covered
- your own ideas.

If you do not have access to Minecraft you could:

- draw your design
- build your own using simple materials. You could use this [video](#) link for an example of how to do this:

<https://www.youtube.com/watch?v=nEKTrTWMZZ8>. Please note that the linked video is externally-produced material, for which no responsibility can be taken.

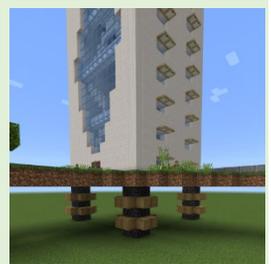


Image: Jay Fenney

You can find out more about a **real-life 'catastrophe consultant'** here:

<https://www.thisisengineering.org.uk/meet-the-engineers/josh/>