An Ancient Kitchen Counter!

The rock making up this kitchen counter is Morton gneiss, this rock is found in the Minnesota River Valley of southwestern Minnesota. It's the oldest rock in North America and one of the oldest rocks found on earth. Dated **3.524 billion years old** (± 9 million years) by analysis of its zircon crystals.

What's in it? When cut and polished, Morton gneiss shows bands and swirls of black, pink, and gray, with white flecks that sometimes look like galaxies and nebulae floating in space. The rock's colors come from **quartz** (white), **orthoclase** feldspar (pink), **plagioclase feldspar** (light gray), **biotite mica** and **hornblende** (both black).

Formation. Morton gneiss started out as a grey granite, formed about **3.5 billion years ago** deep beneath the surface of the earth. The molten rock cooled slowly, forming grains of crystallized minerals.

About a billion years later, two fragments of the earth's crust collided at the future location of southwestern Minnesota, subjecting the granite to heat and pressure. These forces melted it once again and allowed intrusions of molten pink granite. The two granites folded and twisted; when they eventually hardened, the twists and folds remained. 800 million years later, another geologic heating event added additional color and texture.

About one hundred million years ago, geologic forces slowly pushed Morton gneiss to the earth's surface. The glaciers that advanced and retreated across southwestern Minnesota between **two million and 12,000 years ago** covered the rock with hundreds of feet of soil and rock.

Exposed! When the glaciers began receding about **12,000 years ago**, a vast body of water known as Lake Agassiz formed from melting ice in southern Canada, Minnesota, and North Dakota. When the huge rock/ice dam holding the lake broke, a massive flood flowed southward it carved out the Minnesota River valley. This powerful flow washed away hundreds of feet of glacial deposits and exposed the Morton gneiss.