

Geofacts

(AKA Geological Fun Facts)

Updated – 12/22/2012

1. **Theory: diamonds are forever** – Actuality: Diamonds are actually not forever. They are unstable on the Earth's surface and will eventually degrade into a stable form of carbon (graphite). But don't worry, this will not happen in anyone's lifetime that you know.
2. **The only continent with no desert is Europe.** A desert is determined by the amount of precipitation not temperature and Antarctica gets very little snowfall.
3. **Theory: Birthstones are minerals or gems.** Actuality: Only 11 of the 12 birthstones are minerals. Minerals are naturally occurring substances with definite properties. The 12th, pearls, are not naturally occurring, they are produced biologically by mollusks.
4. **Theory: It is warmer in the summer because we are closer to the sun.** Actuality: Only the southern hemisphere is closer to the sun in their summer. The northern hemisphere is further away for theirs. The actual cause of the warmer season is due to the angle of sunlight. When the northern hemisphere is pointed towards the sun it is warmer and vice versa.
5. Naturally forming chalk is actually made up of millions of little fossils called coccoliths, which were the round "shells" of animals called coccolithophores.
6. **Theory: Concrete is a rock.** Actuality: Minerals are always considered naturally formed, whereas depending on the definition you look at, rocks don't always have to be. So in essence, sometimes concrete (and other non-natural rock/mineral conglomerates) can be considered rocks (from a certain point of view).

Geological Facts of the Month

7. **January 2011** - The study of earthquakes started in at least 350 BC when Aristotle noticed that soft grounds shake more than the hard rocky ground.
8. **February 2011 - Theory: Ice is a Mineral.** Minerals are defined by being an inorganic, naturally forming, substance with a definite chemical composition and usually a definite crystal structure. All of which ice satisfies. So by definition, ice is a mineral. Just one with a significant lower melting point than we are usually accustomed to.

10. April 2011: Question - What is the most common mineral in the crust and surface of the Earth?

Answer: Depending on how you look at it there are two possible minerals. Quartz is the most common mineral on the surface of the Earth but Feldspar is the most common mineral in the crust. Feldspar though, is commonly considered a group of minerals, which includes Potassium-Feldspar and Plagioclase.

11. May 2011 - Diamonds are older than the dinosaurs. The youngest natural diamond is over 900 million years old

12. June 2011 - Dense as a Rock? Rocks are generally assumed to be hard, dense objects that would sink in water without a problem. But there are rocks out there that are not dense at all. The lightest rock is pumice, which has a very low density and is produced during a volcanic eruption. Magma is blasted into the air and cools. The large amount of resulting pore space in the rock produces enough buoyancy that the rock can actually float.

13. July 2011 - Geology in Art: It is thought that the reason the sky is red in Edvard Munch's "The Scream" is due to the volcanic sunset caused by the eruption of Krakatoa in 1883.

14. August 2011 - Moonquakes? Even though the moon is technically "inactive" there is some shaking still going on. The epicenters range from 700 km below the surface to 10-20 km below. And since the moon is so dry, they can keep going for more than 10 minutes. It's like "vibrating ... A tuning fork".

15. September 2011 - What is the Age of the Oldest Rock on Earth? The oldest rock on Earth is a granite protolith that has been dated to 4.03 Ga (billion years). Although there are reports of a possibly older rock (a faux-amphibolite) dated up to 4.28 Ga but there is some controversy about those rocks. Both of these rocks have been found in northern Canada.

16. October 2011 - What kind of waves are produced in an earthquake?

It is usually thought that there are only two main types of seismic (earthquake) waves. These are the Primary (P) Waves and the Secondary (S) Waves. But there is also a third main category called Surface Waves. These can be broken into 2 categories called Love and Rayleigh Waves. Surface Waves are the actual waves that shake the ground during an earthquake. Love Waves shake the ground back and forth while Rayleigh Waves shake it up and down.

17. November 2011 - The Phanerozoic Eon is the time period consisting of the last 540 million years and means "Visible life". Although originally thought to correspond with the evolution of life it is now known to represent the evolution of hard parts (like shells). Life truly evolved over 3.2 Ga (billion years ago) and possibly even as early as 3.85 Ga.

18. December 2011 - Myth: Volcanoes grow slowly. While often true in terms of human perception (not in geologic terms) there are some notable exceptions. One of the fastest growing volcanoes in recorded history is a cinder cone that came up in a farmer's field in Mexico. The volcano, Paricutin, grew over 336 meters in 1943, the first year of its life.

19. January 2012 - Myth: Dinosaurs are Extinct. While all non-flying dinosaurs are extinct, there is overwhelming evidence that birds are descendants of dinosaurs, making them dinosaurs themselves. So the next time you eat a turkey or a chicken, you are eating a dinosaur.

20. February 2012 - Myth: Pluto was stripped of planethood because people didn't like it - In reality, the reason Pluto got demoted is because the definition of a planet was not set until the

International Astronomical Union (IAU) defined it in August, 2006. In short they stated that a planet

1) Orbits the Sun

2) Is relatively round

3) Has cleared its orbital neighborhood

#3 is the reason Pluto was demoted. Pluto's moon, Charon is about half the size of Pluto and does not orbit Pluto. They basically orbit the same point in space making it more of a binary system and not a lone planet. So by definition Pluto is not a lone object orbiting the sun and therefore is not a planet.

21. March 2012 - Question: How Slow is "Slow as a Glacier"? Even though glaciers are typically thought of to move very slowly (think inches at most a year), in actuality they can move amazingly fast. Some glaciers in Greenland have been clocked at going 12,600 meters per year. That is about 1.4 m/hr or 4.7 ft/hr!

22. April 2012 - Topic: Supercontinents. It is relatively well known that there was at least 1 supercontinent in the past - Pangea. But in actuality there have been numerous instances of supercontinents during different time periods.

Pangea: ~300-~180 Ma (million years ago)

Rodinia: ~1000-~700 Ma

Columbia: ~1.65-~1.5 Ga (billion years ago)

Kenorland: ~2.5-~2.2 Ga

There are other possibilities during different times but these are the best supported.

23. May 2012 - Topic: Diamonds - When you think of it there doesn't seem to be any greater divide than between diamonds and graphite (the lead in your pencils) but in actuality they are both made of the same "stuff". They both are made up of carbon atoms just in different configurations. If you were to heat up graphite to a high enough temperature you could actually make your own diamonds!

24. June 2012 - Topic: Planets - When Pluto was demoted (see previous fact) there was a new category created called "Dwarf Planet". Unlike a Planet, a dwarf planet does not

need to clear its orbital neighborhood. In addition to Pluto There are 4 other current Dwarf Planets. One is the largest asteroid in the Asteroid Belt between Mars and Jupiter. It is called Ceres. The others are in the Kuiper Belt or beyond, which is out beyond the orbit of Pluto. These are Eris, which is larger than Pluto, Haumea, and Makemake.

25. July 2012 - Myth: The Asteroid Belt was a planet that was ripped apart -

Currently scientists believe that the Asteroid Belt, located between Jupiter and Mars, never actually formed into a planet. There is evidence though that a proto-planet did initially form but it never fully congealed. The competing gravity wells from Jupiter and the sun were too great for one to finish forming.

26. August 2012 - Myth: My compass points to the North Pole - The Magnetic North Pole is not in the same location as the real North Pole. In actuality it is located near Ellesmere Island in Canada. But on top of that, it has moved throughout history and is currently moving at about 40 miles per year. It even flips with the South Pole on a regular basis every ~0.8 million years.

27. September 2012 – Myth: A comets tail points towards the sun. Contrary to an initial assumption that the sun's gravity would pull everything towards it, a tail of a comet it actually pushed away from the sun by the solar winds and only appears when it nears the sun.

28. October 2012 – Question: Do the Continents move at the same rate that fingernails grow? The continents have been clocked at pretty accurate speeds using GPS. It is known that the plates move at speeds between 2 and 10 cm/yr. Fingernail growth on the other hand grows on average up to 4 cm per year. So most plates do move at the speed of fingernail growth but some, like the Pacific Plate can move over twice as fast.

29. November 2012 – Topic: Attacking Volcanoes – Even though most of the eruptive materials from a volcano can be outrun there is one that moves extremely fast. Pyroclastic Flows can reach temperatures greater than 800^o F and move at speeds greater than 100 mph. This makes them the most dangerous volcanic eruptive event.

30. December 2012 – Myth: there's plenty of water to go around. Out of all the water on the Earth, 97.5% is salt water. This means it is not able to be consumed by humans. Of the remaining 2.5%, 70% of that is frozen in the icecaps, and most of the remaining 30% is in soil and deep groundwater deposits. So out of all of the water on Earth, <1% is available for human consumption (i.e. in rivers, streams, and shallow aquifers).

31. Question – What is the Earth's most common mineral? Looking at the bulk composition of the Earth, the most common mineral is a silicate mineral with a perovskite structure that dominates the lower mantle. This mineral has recently been named "bridgmanite".