

Here is the full explanation Keith Barger offered about a super moon and super blue moon. Keith is a space engineer in Colorado Springs and previously worked for the Space Foundation as an educator.

By Keith Barger

The moon's orbit around Earth is not a perfect circle (no orbits are), meaning there are times in the moon's orbit around Earth that it is farther away from Earth and there are times when it is closer to Earth.

On average, the moon is about 238,000 miles (383,000 km) from Earth. A supermoon is when the moon is closer to Earth in its orbit, appearing bigger or "super."

From Earth, we only see about 50-58% of the Moon's surface. Think of it as we only see the moon's face and never get to see the back of its head.

As we observe the moon going around in its orbit, we see variations in the amount of sunlight that is reflected off the moon's surface back to Earth (the amount of sun reflected off its "face") and we call these variations "Phases." We give names to particular phases like new moon, where we see no sunlight reflected from the moon's surface; crescent moon, where we only see a small sliver of sunlight reflecting off the moon's surface, less than 25% of the moon's surface; quarter moon, where we see the sunlight reflecting off roughly 25% of the moon's surface; gibbous, where we see the sunlight reflecting off 26%-49% of the moon's surface; and full moon, where sunlight reflects off around 50% of the moon's surface.

It takes roughly 27 days for the moon to complete its orbit around the Earth. So with that, we typically experience one full moon each month. A blue moon is an event where we experience a second full moon in the same month. Hence the saying, "Once in a blue moon."

Put it all together and a super blue moon is a second full moon event in the same month that happens to occur at a period in the moon's orbit where it is closest to Earth!