

How Far is the Moon?

The Earth and Moon are often shown like this, but do you think images like these show the true distance to the Moon?

Space is incredibly big and it can be very difficult to get a perspective on just how extensive it is, so let's play a game and get an idea of how far our lunar neighbour actually is.



Credit: DS2A Presentation Moon

How Big is the Moon?

If we are going to guess distances, it makes sense to try to understand the relative sizes of the Earth and Moon to begin with.

The diameter of the Earth is 12,756km at the widest point (the Equator) and the diameter of the Moon is 3,474km. Those numbers are quite hard to imagine, but if we scale both of those things down, there is roughly the same difference between the size of a basketball (the Earth) and a tennis ball (the Moon).



Credit: Edgar Chaparro Unsplash



Credit: Ben Hershey Unsplash

Now that we have a better idea of the size difference between the two, how far away would the tennis ball Moon have to be from the basketball Earth to be to scale?

Try This!

Why not make it a competition? Get one family member to be the "Earth" and hold the basketball. Everyone else has to show where they think the moon would be.

At this scale, the correct distance for the tennis ball is 7.37 meters (about 24 feet) from the basketball. That's much farther than most people would think!

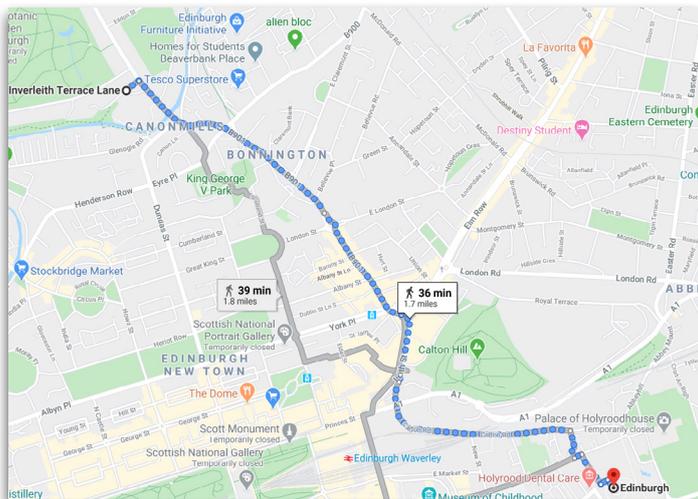
The actual distance between the Earth and Moon averages at 384,400km but, because everything in space is constantly moving, distances can be tricky to calculate. Think about it... the Earth and the Moon are constantly orbiting the sun and the moon is also orbiting the Earth, and they are both spinning on their own axis as well, all at the same time!



The iconic Earthrise photo taken by astronauts on the Apollo 8 mission. Photo Credit: NASA

Speaking of the sun, why not add this into the mix as well now that we have good grasp of where the Earth and Moon are.

So How Far is the Sun?



Sticking with the same scale (basketball Earth and tennis ball Moon, 7.37m apart), how far do you think the sun is?

The sun is around 150 million km away from the Earth, and on our scale that is a massive 2.8km away (around 1.75 miles). That's around the same distance as it would be to walk from Dynamic Earth to the Royal Botanical Gardens in Edinburgh which takes almost 40 minutes!

Try This!

Use Google Maps to work out where the sun would be in relation to your basketball Earth.



So Why is this Important?

The size and extent of space is something that is poorly understood by almost everyone, including many experts. The enormous distances involved in space and space travel are one of the elements that make it so tricky. When people understand just how big space is, it can really highlight the difficulties faced when we think of future journeys to other planets and moons in our solar system.

As space travel becomes more commonplace, humanity will need incredible teams of dedicated people across the globe to overcome these massive challenges as we step out to explore the cosmos.

For more information on the Destination Space programme please visit www.destination-space.org

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