



Video/ Slide show

## The Secret of the Dark Side of the Moon.

### **Sizes of objects:**

diameter of the earth – 12,759 km (7,926 miles),

diameter of the moon – 3,475 km (2,159 miles).

### **Distance between the earth and the moon**

The actual distance varies between 363,000 and 406,000 km (depending on the current location on the orbit which happens to be not perfectly round).

It is a distance more or less 30 times greater than the diameter of the earth. Therefore, taking into consideration the sizes of both balls, the length of the string (that is, the distance between the moon and the earth) should be 750 cm.

### **How big is the moon?**

The values describing the diameters of the earth and the moon are large numbers and it is difficult to imagine them.

Therefore, it is worth comparing them to something else. For example, the maximum allowable speed at which you can drive on the highways outside cities in the majority of states is 70 mph (110 km/h). If we drove at this speed, it would take us 115 hours, that is almost five days, to travel the distance equal to the diameter of the earth – 7,926 miles (12,759 km), whereas traveling the distance equal to the diameter of the moon – 2,159 miles (3,475 km) would take us 31 hours. In order to travel the distance between the earth and the moon, we would need four and a half months.

### **What is an orbit?**

The moon moves around the earth on a track (an orbit) which is not perfectly round, but oval – it resembles an egg. Therefore, the moon is closer to the earth at times – it is then 363,000 km away (it would take us about four and a half months to get there if we traveled on a highway). Sometimes, however, the distance between the moon and the earth is greater – 406,000 km (if we drove at the speed of 110 km/h, it would take us over five months to get to the moon).

### **What do we know about the moon?**

Our knowledge of the moon is not complete yet. Technological developments allow us to analyze the data sent to us by the devices that observe the moon, and to formulate new theories. The most recent one is the theory of two moons that have melted into one. Researchers are still working to confirm this theory.



Movement game

The rules of the Moon's movement.

**Does the moon move?**

There are two ways in which the moon moves. The first one is the moon's rotation around its own axis (rotational motion), which takes 27.3 days. The second one is the moon's rotation around the earth (orbital motion, that is movement around the earth on an orbit), which also takes 27.3 days.

**Why do we see only one side of the moon?**

In the case of the moon, both motions – rotational and orbital – take exactly the same amount of time – 27.3 days. That is why the moon always faces the earth with the same side. We talk about the invisible side of the moon because we are unable to see it from the earth.



Experiment

## Moon phases observed from the Earth.

### **Does the moon shine?**

How is it possible for us to see the moon, despite the fact that it does not emit any light?

The moon does not generate light on its own – it only reflects sunlight. Except for the so-called black bodies, all objects reflect the light to a certain extent and that is why we are able to see them. The surface of the moon is lit by the sun, and so sunlight is reflected from the surface of the moon – that is why we can see the moon.

### **Does the earth shine?**

The earth also just reflects sunrays.



#### Conclusions

Identifying which Moon phase will appear next.

#### **How to identify which phase will appear soon?**

The most common mnemonic used to remember the phases of the moon is "DOC". Using this, you can understand which part of the moon is lit up at different stages in the lunar cycle.

- The capital "D" has an arch to the right. The right-hand side is illuminated: First Quarter Moon.
- The capital "O" represents the Full Moon.
- The capital "C" has an arch to the left. The left-hand side is illuminated: Last Quarter Moon.

Variation:

- DOC, "Dog comes in (the room), Cat goes out",
- Light Left, Last Quarter.

Source: <https://www.mnemonic-device.com/astronomy/moon/lunar-phases/>