





Apollo 17 View of Earth

Just hours after its liftoff from the Kennedy Space Center in Florida, the crew of Apollo 17 found themselves aligned with Earth and the Sun, enabling them to take this full disk view of Earth. The astronauts were coasting towards the Moon, approximately 40,000 kilometers from Earth, when this picture was taken. Because the mission took place during the beginning of the summer in the Southern Hemisphere, the Southern Hemisphere is brightly lit by the Sun. The entire continent of Africa, much of the ice-locked continent of Antarctica, and small portions of Europe and the Asian mainland are visible in this photograph. Tawny colored land masses on Africa are the Sahara, Libyan, and Arabian deserts. The dark band across Africa is the grasscovered savannah and the areas covered most y with broken clouds are the tropical rain forests. To the east of Africa is the island of Madagascar. Extensive weather systems of swirling clouds generated in Earth's atmosphere are visible from space

Apollo 17 lifted off at 12:33 a.m. on December 7, 1972. It was the last of the Apollo expeditions to the Moon. Onboard were astronauts Eugene A. Cernan (commander), Ronald E. Evans (pilot), and Harrison H. Schmitt (lunar module pilot). Three days later, their twin spacecraft, the *America* (command and service modules) and the *Challenger* (lunar lander), entered lunar orbit. Twenty-three hours later, *Challenger* with Cernan and Schmitt onboard, touched down on the lunar surface in the Taurus-Littrow region. Over the next three days, Cernan and Schmitt explored the lunar surface, deployed experiments, and collected 115 kilograms of lunar rock and soil to return to Earth for analysis and study. Following a three-day return voyage, the crew rode *America* back into Earth's atmosphere and splashed down in the Pacific Ocean.

For the Classroom

1. How big did Earth appear to the Apollo 17 crewmembers when this picture was taken? Set up a scale model of the positions of Earth and Apollo 17 by placing a globe on a table and standing back from it at a scale distance representing 40,000 kilometers. To determine that distance, measure the diameter of the globe in centimeters. This can be done with dividers or by wrapping a string around the globe. Measure the string's length in centimeters and solve the following equation for diameter: $C=\pi d$

Next, calculate the scale of your globe by dividing the diameter of Earth (12,756 kilometers) by the diameter of the globe in centimeters. If the answer is 500, for example, the scale of the model is 1 centimeter equals 500 kilometers.

2. Compare this picture to world maps. Are the shapes and relative sizes of Africa, Antarctica, and Madagascar the same in both the picture and the maps? If not, why is there a difference?
3. Notice the thickness of Earth's atmosphere along Earth's limb (the apparent outer edge) in this picture. Why is it so thin? (Consider how thick the atmosphere would appear in the scale of the picture and how the density of the atmosphere changes with altitude.)
4. Over the past few decades, the island of Madagascar has experienced extensive deforestation. How might this land look in a picture taken from space today?

Reference

To learn more about the Apollo 17 mission to the Moon, look up the publication listed below:

NASA, (1975), [Apollo Expeditions to the Moon](#). National Aeronautics and Space Administration, SP-350, Washington, D.C.