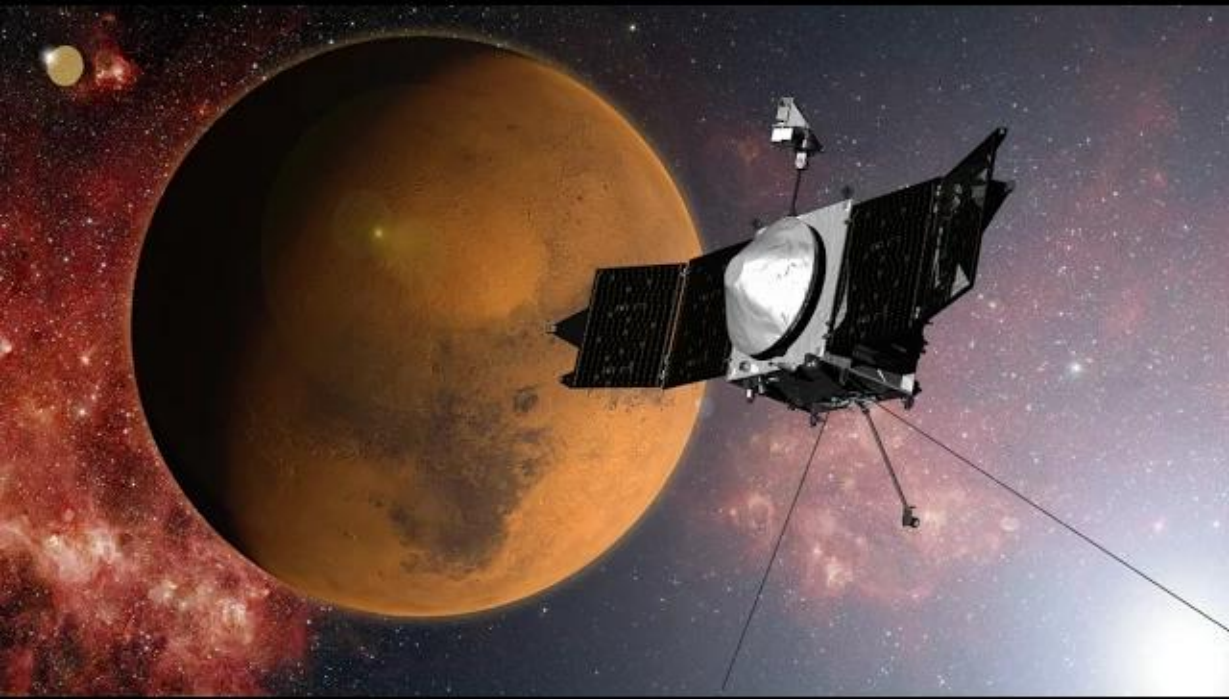

1
00:00:00,020 --> 00:00:08,850
[ambient sound]

2
00:00:08,870 --> 00:00:13,210
If you want to send a spacecraft from Earth to Mars, how would you get it there?

3
00:00:13,230 --> 00:00:20,980
You can't aim straight at the Red Planet because it's moving around the Sun almost 13,000 mph slower than th

4
00:00:21,000 --> 00:00:24,680
Instead, you'll have to wait for up to 26 months for the Earth and Mars

5
00:00:24,700 --> 00:00:29,980
to be in just the right spot in their orbits, then carefully aim at a moving target.

6
00:00:30,000 --> 00:00:35,630
In November 2013, the controllers of NASA's Mars Atmosphere and Volatile EvolutioN mission,

7
00:00:35,650 --> 00:00:42,730
or MAVEN, did just that, launching the Mars-bound orbiter from Cape Canaveral, Florida on an Atlas V rocket.

8
00:00:42,750 --> 00:00:48,130
After separating from the rocket and the Centaur upper stage, MAVEN unfolded its solar arrays,

9
00:00:48,150 --> 00:00:52,280
pointed them at the Sun, and embarked on a ten-month cruise to Mars.

10
00:00:52,300 --> 00:00:56,040
The launch sent MAVEN arcing outward on a path called a transfer orbit,

11
00:00:56,060 --> 00:01:01,080
which will intersect with the orbit of Mars on September 21, 2104.

12
00:01:01,100 --> 00:01:04,410
By starting its journey when the Earth was behind Mars, MAVEN has been

13
00:01:04,430 --> 00:01:09,040

taking advantage of our planet's greater speed to catch up to its target.

14
00:01:09,060 --> 00:01:13,230
When MAVEN arrives, it will not be automatically captured by Mars's gravity,

15
00:01:13,250 --> 00:01:19,850
but will instead need to perform an engine burn to change its velocity by over 2,700 miles per hour.

16
00:01:19,870 --> 00:01:25,280
Just before Mars Orbit Insertion, the spacecraft will turn its thrusters in the direction of travel,

17
00:01:25,300 --> 00:01:30,820
then MAVEN will fire its engines for thirty-three minutes. The engine burn will slow MAVEN's velocity,

18
00:01:30,840 --> 00:01:37,380
allowing Mars's gravity to take over, and pulling the spacecraft into an elongated 35-hour orbit.

19
00:01:37,400 --> 00:01:41,210
In the following weeks MAVEN will reduce its orbit to four-and-a-half hours,

20
00:01:41,230 --> 00:01:45,180
then it will deploy its science instruments and begin collecting data.

21
00:01:45,200 --> 00:01:50,380
MAVEN's findings will reveal how Mars changed from a warm, wet planet early in its history,

22
00:01:50,400 --> 00:01:59,630
to the cold, dry world we see today, shedding light on one of the solar system's biggest mysteries.