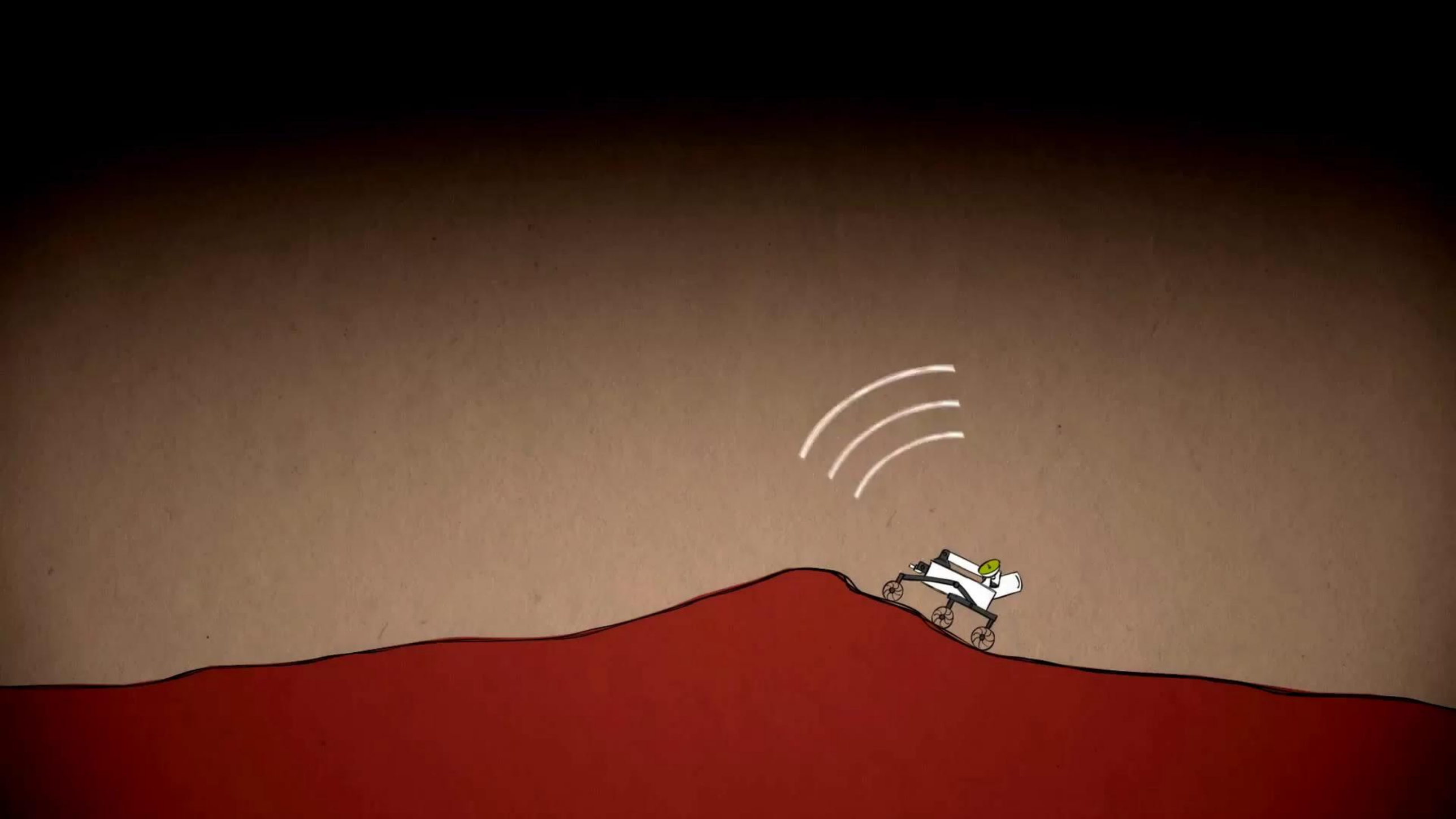

1
00:00:00,000 --> 00:00:04,000
Music.

2
00:00:04,000 --> 00:00:07,000
Narrator: After seven dramatic minutes of entry, descent and landing,

3
00:00:07,000 --> 00:00:11,000
everyone will want to know: did Curiosity survive?

4
00:00:11,000 --> 00:00:15,000
There's a possibility we won't know. At least not right away.

5
00:00:15,000 --> 00:00:18,000
During its descent through the atmosphere, Curiosity must switch to a new antenna

6
00:00:18,000 --> 00:00:20,000
for each transformation it makes.

7
00:00:20,000 --> 00:00:24,000
At each switch, we could lose lock on the signal for a short time.

8
00:00:24,000 --> 00:00:29,000
That won't hurt the rover. It just means we won't know what's happening right away.

9
00:00:29,000 --> 00:00:32,000
Even with a solid signal, the communications link direct to Earth

10
00:00:32,000 --> 00:00:35,000
only works during the first half of the rover's descent.

11
00:00:35,000 --> 00:00:40,000
Why? Like Earth, Mars is spinning -- and during landing Curiosity and its landing site

12
00:00:40,000 --> 00:00:43,000
will disappear from view, like the sun setting.

13
00:00:43,000 --> 00:00:46,000

Out of sight equals the end of direct radio contact.

14
00:00:46,000 --> 00:00:50,000
But... NASA has two spacecraft orbiting Mars that can help.

15
00:00:50,000 --> 00:00:54,000
For the second half of Curiosity's descent, the Mars Odyssey orbiter is in a good place

16
00:00:54,000 --> 00:00:57,000
to pick up the rover's signal and send it right back to Earth.

17
00:00:57,000 --> 00:01:02,000
To best hear Curiosity's signal, Odyssey must rotate about an hour before landing.

18
00:01:02,000 --> 00:01:07,000
That sounds easy, but engineers are asking Odyssey to perform a maneuver it's never tried before.

19
00:01:07,000 --> 00:01:11,000
Will it work? Probably. But it's not a sure thing.

20
00:01:11,000 --> 00:01:16,000
If Odyssey doesn't rotate successfully, never fear! The rover won't be affected whatsoever!

21
00:01:16,000 --> 00:01:21,000
Once again, it just means we have to wait longer to hear from the rover.

22
00:01:21,000 --> 00:01:24,000
Odyssey could perform as hoped, but we're still not home free!

23
00:01:24,000 --> 00:01:26,000
Engineers always think of 'what ifs.'

24
00:01:26,000 --> 00:01:29,000
For instance, what if the rover lands on a slope?

25
00:01:29,000 --> 00:01:34,000
If so, the low-flying Odyssey orbiter might not be able to pick up its signal.

26
00:01:34,000 --> 00:01:38,000
Even if everything goes according to plan with Odyssey, there's a final challenge:

27
00:01:38,000 --> 00:01:40,000
time.

28
00:01:40,000 --> 00:01:44,000
The rover may be standing safe on Mars, but Odyssey has to be quick in getting the signal.

29
00:01:44,000 --> 00:01:46,000
Odyssey is moving fast.

30
00:01:46,000 --> 00:01:51,000
It will only be in the line of sight to hear from the rover for a few minutes -- perhaps no more than five.

31
00:01:51,000 --> 00:01:54,000
So the Mars Reconnaissance Orbiter plays the role of backup.

32
00:01:54,000 --> 00:01:59,000
It will also fly overhead to capture what happens and then store the landing data it collects onboard,

33
00:01:59,000 --> 00:02:02,000
for playback to Earth a few hours later.

34
00:02:02,000 --> 00:02:06,000
Engineers then have to decode the data, which takes several hours.

35
00:02:06,000 --> 00:02:08,000
Sometime in the middle of the night for Curiosity's mission team,

36
00:02:08,000 --> 00:02:12,000
it's possible that the orbiter could tell us the rover's fate.

37
00:02:12,000 --> 00:02:15,000
Or, there are other scenarios where the rover might be perfectly safe,

38
00:02:15,000 --> 00:02:18,000

but we might not hear from it for three days.

39
00:02:18,000 --> 00:02:22,000
That's all to say: Curiosity's landing is filled with drama and we'll need lots of patience.