1
00:00:23,849 --> 00:00:22,019
one of the most challenging aspects of

2
00:00:25,830 --> 00:00:23,859
this mission happens before we even land

3
00:00:31,740 --> 00:00:25,840
and it's picking the right landing site

4
00:00:33,299 --> 00:00:31,750
for the mission we want to study the

5
00:00:35,069 --> 00:00:33,309
habitability of Mars we want to really

6
00:00:36,600 --> 00:00:35,079
figure out if it was ever capable of

7
00:00:38,579 --> 00:00:36,610
supporting life and the way we do that

8
00:00:47,369 --> 00:00:38,589
is to really follow the evidence of

9
00:00:48,979 --> 00:00:47,379
water on Mars one of the most

10
00:00:51,869 --> 00:00:48,989
interesting things about Mars is that

11
00:00:53,700 --> 00:00:51,879
it's changed over time what we see on

12
00:00:56,130 --> 00:00:53,710
Mars today is very different from what

13
00:00:57,570 --> 00:00:56,140

occurred in the distant past and water

14
00:00:59,100 --> 00:00:57,580
is the real interesting thing that we're

15
00:01:05,429 --> 00:00:59,110
looking for the history of water how

16
00:01:06,929 --> 00:01:05,439
it's changed over time one of the

17
00:01:08,580 --> 00:01:06,939
biggest challenges to studying

18
00:01:10,830 --> 00:01:08,590
habitability on Mars which is the goal

19
00:01:12,539 --> 00:01:10,840
of the Curiosity rover mission is to try

20
00:01:14,580 --> 00:01:12,549
to follow that signature of water where

21
00:01:16,380 --> 00:01:14,590
is where was the water how long was it

22
00:01:18,210 --> 00:01:16,390
there and where do we go to look for

23
00:01:19,560 --> 00:01:18,220
evidence of it if we were somewhere like

24
00:01:21,899 --> 00:01:19,570
this where there's a pretty obvious

25
00:01:23,429 --> 00:01:21,909
geologic record of water flowing

26
00:01:25,559 --> 00:01:23,439
carrying material down that would be a

27
00:01:27,660 --> 00:01:25,569
home run but the real challenge is

28
00:01:33,460 --> 00:01:27,670
finding that one spot on Mars to send

29
00:01:38,600 --> 00:01:36,710
we have four wonderful landing sites all

30
00:01:41,300 --> 00:01:38,610
very different in character and the real

31
00:01:43,370 --> 00:01:41,310
challenge for us as scientists is to

32
00:01:44,950 --> 00:01:43,380
come to a consensus on which one of

33
00:01:46,640 --> 00:01:44,960
those sites offers the best chance

34
00:01:48,530 --> 00:01:46,650
fulfilling the goals of the mission

35
00:01:51,230 --> 00:01:48,540
there's a place on Mars called Mars

36
00:01:53,600 --> 00:01:51,240
Valles which has the brightest mineral

37
00:01:55,910 --> 00:01:53,610
signature of clay minerals on mars and

38
00:01:58,190 --> 00:01:55,920

these clay minerals are known to form in

39
00:02:00,590 --> 00:01:58,200
the presence of water and neutral pH

40
00:02:01,880 --> 00:02:00,600
water not acidic not too basic just the

41
00:02:03,830 --> 00:02:01,890
kind of water that you thought it would

42
00:02:06,860 --> 00:02:03,840
be friendly to life then you have

43
00:02:08,389 --> 00:02:06,870
terrestrial geologists who say that the

44
00:02:11,180 --> 00:02:08,399
rock record should be the thing that we

45
00:02:14,270 --> 00:02:11,190
follow the landforms that look like they

46
00:02:16,220 --> 00:02:14,280
were carved by rivers or floods so you

47
00:02:18,530 --> 00:02:16,230
have sites like Holden crater which is a

48
00:02:21,080 --> 00:02:18,540
big impact crater many miles across with

49
00:02:22,790 --> 00:02:21,090
a river coming into it perhaps forming a

50
00:02:25,910 --> 00:02:22,800
lake multiple times and flooding the

51
00:02:28,250 --> 00:02:25,920
crater leaving a geologic record that we

52
00:02:29,900 --> 00:02:28,260
can study with curiosity just upstream a

53
00:02:33,080 --> 00:02:29,910
little bit from Holden crater there's a

54
00:02:35,120 --> 00:02:33,090
place called Evers wal crater that same

55
00:02:37,760 --> 00:02:35,130
river system in Everest walls has left

56
00:02:39,350 --> 00:02:37,770
evidence of a delta just like the

57
00:02:42,140 --> 00:02:39,360
Mississippi River Delta these things

58
00:02:44,810 --> 00:02:42,150
form when muddy silty water deposits

59
00:02:46,850 --> 00:02:44,820
it's silt smudge into a formation into a

60
00:02:48,380 --> 00:02:46,860
standing body of water like a lake so

61
00:02:50,000 --> 00:02:48,390
you have people that study Delta's on

62
00:02:53,170 --> 00:02:50,010
earth you think that's the place

63
00:02:55,820 --> 00:02:53,180

curiosity should go the final site is

64
00:02:59,360 --> 00:02:55,830
the best place on Mars if you want to

65
00:03:00,800 --> 00:02:59,370
just study layered materials so why why

66
00:03:03,500 --> 00:03:00,810
do we like layered materials because

67
00:03:06,080 --> 00:03:03,510
just like this outcrop behind me they

68
00:03:07,580 --> 00:03:06,090
give a record of time of how things

69
00:03:10,920 --> 00:03:07,590
change over time by studying different

70
00:03:12,860 --> 00:03:10,930
layers you can rebuild the geologic

71
00:03:15,990 --> 00:03:12,870
so there's a place called Gale Crater

72
00:03:18,240 --> 00:03:16,000
which has a 3-mile stack of layered

73
00:03:20,520 --> 00:03:18,250
rocks now we don't exactly know how much

74
00:03:22,199 --> 00:03:20,530
how those layers formed and the

75
00:03:24,420 --> 00:03:22,209
mineralogical evidence isn't as strong

76
00:03:26,880 --> 00:03:24,430
as other sites but people who just think

77
00:03:28,619 --> 00:03:26,890
layers are the thing to study really

78
00:03:30,179 --> 00:03:28,629
love Gale so you have these four

79
00:03:32,640 --> 00:03:30,189
different sites and these four different

80
00:03:34,679 --> 00:03:32,650
groups and very passionate arguments

81
00:03:36,750 --> 00:03:34,689
back and forth to try to really narrow