1
00:00:04,430 --> 00:00:03,050
his earth unique in the solar system the

2
00:00:07,610 --> 00:00:04,440
only place where life could have taken

3
00:00:09,470 --> 00:00:07,620
hold or could such an environment have

4
00:00:11,150 --> 00:00:09,480
existed at some point on Mars where

5
00:00:12,890 --> 00:00:11,160
water and key chemical building blocks

6
00:00:14,839 --> 00:00:12,900
could have come together in a way that

7
00:00:17,720 --> 00:00:14,849
could support the smallest most basic

8
00:00:20,330 --> 00:00:17,730
forms of life the Mars Science

9
00:00:22,490 --> 00:00:20,340
Laboratory Rover NASA's new robotic

10
00:00:27,970 --> 00:00:22,500
vehicle for exploring Mars is heading to

11
00:00:33,530 --> 00:00:31,100
so how does a robotic Rome try to find

12
00:00:36,470 --> 00:00:33,540
answers by copying what its human

13
00:00:39,050 --> 00:00:36,480

creators give on earth geologists might

14
00:00:41,300 --> 00:00:39,060
check out a map drive out to a remote

15
00:00:43,100 --> 00:00:41,310
location and hike to a possibly

16
00:00:45,290 --> 00:00:43,110
hard-to-reach spot where they could see

17
00:00:47,330 --> 00:00:45,300
layers of ancient rocks like in the

18
00:00:50,299 --> 00:00:47,340
walls of a dried-up riverbed for the

19
00:00:52,250 --> 00:00:50,309
sides of a canyon MSL is an incredible

20
00:00:54,320 --> 00:00:52,260
Rover because it has an amazing ability

21
00:00:55,790 --> 00:00:54,330
to move around we're going to need that

22
00:01:00,290 --> 00:00:55,800
because we're going to have to go into

23
00:01:02,990 --> 00:01:00,300
some tough to reach places it can travel

24
00:01:04,430 --> 00:01:03,000
at least 20 kilometers probably further

25
00:01:06,050 --> 00:01:04,440
we're going to be able to land in a safe

26
00:01:08,240 --> 00:01:06,060
place and go beyond that to where the

27
00:01:10,130 --> 00:01:08,250
really rough rocks are which is where

28
00:01:11,420 --> 00:01:10,140
all the good geologic clues are to tell

29
00:01:14,510 --> 00:01:11,430
us about the early environmental

30
00:01:16,670 --> 00:01:14,520
evolution of Mars in the hunt for

31
00:01:18,320 --> 00:01:16,680
evidence of life on Mars geologists

32
00:01:20,780 --> 00:01:18,330
first have to determine if certain

33
00:01:22,880 --> 00:01:20,790
conditions were right the rock record

34
00:01:25,010 --> 00:01:22,890
shows evidence of certain minerals and

35
00:01:28,130 --> 00:01:25,020
organic molecules the chemical building

36
00:01:30,020 --> 00:01:28,140
blocks on which all life is based so

37
00:01:33,469 --> 00:01:30,030
what MSL would be able to do is it would

38
00:01:36,380 --> 00:01:33,479

it would drive up to this outcrop and it

39
00:01:39,200 --> 00:01:36,390
has a drill that's about a centimeter in

40
00:01:41,389 --> 00:01:39,210
diameter and we would instruct the rover

41
00:01:43,700 --> 00:01:41,399
to drill a hole in the rock and then the

42
00:01:47,060 --> 00:01:43,710
powder that comes out of that would then

43
00:01:48,950 --> 00:01:47,070
travel back into the rover and and it

44
00:01:51,050 --> 00:01:48,960
would be split and it would go into the

45
00:01:53,179 --> 00:01:51,060
two instruments that would analyze the

46
00:01:54,950 --> 00:01:53,189
powder when would give us information on

47
00:01:56,929 --> 00:01:54,960
mineralogy another one would give us

48
00:01:59,810 --> 00:01:56,939
information if there were any organic

49
00:02:00,919 --> 00:01:59,820
molecules in here so really as close as

50
00:02:03,499 --> 00:02:00,929
we can get to putting the field

51
00:02:05,419 --> 00:02:03,509
geologist on Mars and like any good

52
00:02:07,700 --> 00:02:05,429
geologist the Mars Science Laboratory

53
00:02:10,580 --> 00:02:07,710
Rover carries a full pack of gear for

54
00:02:13,340 --> 00:02:10,590
the trip on earth geologists use tools

55
00:02:15,470 --> 00:02:13,350
like compasses Rock hammers and hand

56
00:02:17,570 --> 00:02:15,480
lenses to explore the environment and

57
00:02:19,670 --> 00:02:17,580
study the rocks they might even do a

58
00:02:20,820 --> 00:02:19,680
simple acid test to see what the rocks

59
00:02:22,620 --> 00:02:20,830
are made of

60
00:02:24,570 --> 00:02:22,630
the Mars Science Laboratory Rover

61
00:02:26,550 --> 00:02:24,580
carries a whole laboratory with it

62
00:02:28,620 --> 00:02:26,560
wherever it goes it's much bigger than

63
00:02:30,750 --> 00:02:28,630

any Rover sent before about the size of

64
00:02:32,910 --> 00:02:30,760
a car that means it can carry a lot more

65
00:02:35,550 --> 00:02:32,920
advanced instruments we've got a laser

66
00:02:37,080 --> 00:02:35,560
called chemcam and we're going to be

67
00:02:39,540 --> 00:02:37,090
able to look at rocks that are on the

68
00:02:41,700 --> 00:02:39,550
walls of outcrops or in positions where

69
00:02:43,920 --> 00:02:41,710
we can't we can't really get to it and

70
00:02:45,540 --> 00:02:43,930
we'll be able to shoot this laser beam

71
00:02:47,640 --> 00:02:45,550
and look at the light that's reflected

72
00:02:49,620 --> 00:02:47,650
back to us and get some sense of the

73
00:02:51,810 --> 00:02:49,630
chemical composition of things that we

74
00:02:53,550 --> 00:02:51,820
might not be able to touch all these

75
00:02:55,230 --> 00:02:53,560
capabilities will help scientists

76
00:02:58,050 --> 00:02:55,240
understand the history of the remote

77
00:03:00,690 --> 00:02:58,060
areas one of the questions that people

78
00:03:02,490 --> 00:03:00,700
most often ask is whether or not life is

79
00:03:04,740 --> 00:03:02,500
unique in the universe in our solar

80
00:03:06,630 --> 00:03:04,750
system and the short answer to that is

81
00:03:08,310 --> 00:03:06,640
we don't really know and the only way

82
00:03:10,320 --> 00:03:08,320
we're going to figure this out is to

83
00:03:12,600 --> 00:03:10,330
leave our own planet and we'll explore

84
00:03:15,180 --> 00:03:12,610
other solar systems as well as planets

85
00:03:16,770 --> 00:03:15,190
within our own solar system could Mars

86
00:03:19,260 --> 00:03:16,780
have had an environment capable of

87
00:03:21,600 --> 00:03:19,270
supporting life the Mars Science

88
00:03:24,840 --> 00:03:21,610

Laboratory Rover is taking all the tools

89
00:03:26,610 --> 00:03:24,850
it needs to try to solve this mystery if

90
00:03:28,470 --> 00:03:26,620
all goes well at the end of its journey

91
00:03:30,380 --> 00:03:28,480
the rover will have taken us to places

92
00:03:32,460 --> 00:03:30,390
on Mars we could never reach before

93
00:03:34,560 --> 00:03:32,470
giving us a glimpse back into the

94
00:03:36,960 --> 00:03:34,570
history of the planet and maybe even