



1
00:00:00,450 --> 00:00:07,174
[music]

2
00:00:07,174 --> 00:00:11,311
>> How many of you want
to be aerospace engineers? Okay.

3
00:00:11,311 --> 00:00:13,313
>> Be putting the final touches
on your rover, do some tests,

4
00:00:13,313 --> 00:00:15,465
figure out things now, before
you get to the field.

5
00:00:15,465 --> 00:00:20,003
[music/background conversation]

6
00:00:20,003 --> 00:00:21,955
>> I'm Al Bowers,
I'm the chief scientist

7
00:00:21,955 --> 00:00:24,258
at NASA Armstrong
Flight Research Center.

8
00:00:24,258 --> 00:00:28,395
These kids are in the experience
for journey to Mars which is

9
00:00:28,395 --> 00:00:32,099
to build small Mars rovers
to rescue another rover.

10
00:00:32,099 --> 00:00:33,984
This is their first real
experience with trying

11
00:00:33,984 --> 00:00:37,454

to do something and first
real experience with NASA.

12

00:00:37,454 --> 00:00:43,994
[music]

13

00:00:43,994 --> 00:00:46,246
>> What's the specific
approach your team has taken

14

00:00:46,246 --> 00:00:49,199
and what's the challenge
you're trying to achieve today?

15

00:00:49,199 --> 00:00:52,002
>> Well, right now we're
trying to retrieve all 3 --

16

00:00:52,002 --> 00:00:55,706
at least we know of 3
rovers on the platform.

17

00:00:55,706 --> 00:00:58,792
We have a hammer that is going
to use a motorized action

18

00:00:58,792 --> 00:01:01,812
to bring down a scoop and
hook the rovers back towards

19

00:01:01,812 --> 00:01:02,813
our base.

20

00:01:02,813 --> 00:01:04,998
[music]

21

00:01:04,998 --> 00:01:07,701
>> I'm actually the design
engineer, in a group of three

22

00:01:07,701 --> 00:01:10,938

right now we're just trying to
finalize our process.

23

00:01:10,938 --> 00:01:11,939

>> We'll just create a new
program.

24

00:01:11,939 --> 00:01:14,074

>> We had to reinnovate a couple
times and right now the final

25

00:01:14,074 --> 00:01:16,643

process is just to put the last
minute things together, and

26

00:01:16,643 --> 00:01:20,080

the pressure is really going on
right now.

27

00:01:20,080 --> 00:01:25,102

>> The experience that I had
here was the most life changing

28

00:01:25,102 --> 00:01:27,271

thing I've ever had.

29

00:01:27,271 --> 00:01:28,655

I've never worked in
a group like this.

30

00:01:28,655 --> 00:01:30,574

To come here and work
with people that are

31

00:01:30,574 --> 00:01:33,760

in the same situation as
I'm in and really want it.

32

00:01:33,760 --> 00:01:36,797

>> It's not only mathematics
or engineering,

33

00:01:36,797 --> 00:01:40,017

but also the creativity
aspect is really important.

34

00:01:40,017 --> 00:01:42,653

And if you want to add some
sort of wow factor or some sort

35

00:01:42,653 --> 00:01:46,607

of outside the box thought that
maybe another party hasn't come

36

00:01:46,607 --> 00:01:49,459

up with, you can really
revolutionize an area.

37

00:01:49,459 --> 00:01:50,460

>> Go!

38

00:01:50,460 --> 00:01:54,464

[music]

39

00:01:57,117 --> 00:02:01,121

[rover sounds]

40

00:02:06,126 --> 00:02:09,129

[sighs/groans]

41

00:02:09,129 --> 00:02:12,132

[rover sounds]

42

00:02:12,132 --> 00:02:14,134

[sighs/groans]

43

00:02:14,134 --> 00:02:18,138

[rover sounds]

44

00:02:18,138 --> 00:02:22,142

[gasps]

45

00:02:22,142 --> 00:02:30,150

[sighs/groans]

46

00:02:32,502 --> 00:02:34,221

>> You don't plan for
things to go well.

47

00:02:34,221 --> 00:02:37,474

You plan for things to go
horribly wrong, be willing

48

00:02:37,474 --> 00:02:41,962

to see that risk, you
have to risk things

49

00:02:41,962 --> 00:02:43,964

to be able to achieve things.

50

00:02:43,964 --> 00:02:45,966

If there isn't any chance of
failure, it's a demonstration,

51

00:02:45,966 --> 00:02:46,967

it's not research.

52

00:02:46,967 --> 00:02:48,352

When we actually launched, we
had a little bit of an

53

00:02:48,352 --> 00:02:50,170

asymmetric deployment.

54

00:02:50,170 --> 00:02:52,005

>> Whooooaa!

55

00:02:52,005 --> 00:02:54,091

>> Those were inflatable wings,
so that destroyed them.

56

00:02:54,091 --> 00:02:59,162

Experience comes from making bad
decisions, basically.

57

00:02:59,162 --> 00:03:02,165

The only way to gain some
experience is by failing.

58

00:03:02,165 --> 00:03:04,167

You do everything you can so
that you can learn from those

59

00:03:04,167 --> 00:03:05,035

mistakes.

60

00:03:05,035 --> 00:03:07,304

>> Just seeing everyone else,

61

00:03:07,304 --> 00:03:10,257

engineers already going through
the same struggles, continuing

62

00:03:10,257 --> 00:03:12,292

all these struggles and
failures, but being able

63

00:03:12,292 --> 00:03:13,910

to still turn out fine.

64

00:03:13,910 --> 00:03:15,662

It's great and it
reinforces that fact

65

00:03:15,662 --> 00:03:17,030

that I know that I can do it.

66

00:03:17,030 --> 00:03:19,032

[cheering]

67

00:03:19,032 --> 00:03:23,487

>> It has motivated me to
continue pushing myself.

68

00:03:23,487 --> 00:03:26,690

>> Lots of experiments,
and experiments

69

00:03:26,690 --> 00:03:29,459

and trying and imagination.

70

00:03:29,459 --> 00:03:33,463

[music]

71

00:03:38,518 --> 00:03:51,231

[rover sounds]

72

00:03:51,231 --> 00:03:54,234

[cheering]

73

00:03:54,234 --> 00:03:58,238

[rover sounds]

74

00:03:58,238 --> 00:04:01,241

[cheering]

75

00:04:01,241 --> 00:04:03,243

[rover sounds]

76

00:04:03,243 --> 00:04:10,250

[cheering]

77

00:04:12,986 --> 00:04:14,988

>> I've learned to work
really well with teams.

78

00:04:14,988 --> 00:04:18,241

I've learned the whole entire
robotic design process.

79

00:04:18,241 --> 00:04:20,210

I've learned about some of
the cutting edge missions

80

00:04:20,210 --> 00:04:21,211

that they're doing on Mars.

81

00:04:21,211 --> 00:04:23,864

I've learned -- it
was just crazy --

82

00:04:23,864 --> 00:04:25,816

it was a very wild experience.

83

00:04:25,816 --> 00:04:28,385

Just seeing so many
industry professionals

84

00:04:28,385 --> 00:04:30,504

and so many- how down
to Earth they are,

85

00:04:30,504 --> 00:04:32,072

and how like-minded they are.

86

00:04:32,072 --> 00:04:34,174

And just being a part of that
whole corner was just