1
00:00:04,930 --> 00:00:09,340
I'm Avi Okon, the lead hardware engineer for
the drill, and this is your Curiosity Rover

2
00:00:09,340 --> 00:00:10,340
Report.

3
00:00:10,340 --> 00:00:17,230
Here we are with Curiosity's Earth-bound test
double in the Mars Yard here at JPL.

4
00:00:17,230 --> 00:00:20,900
Curiosity has been repositioned at a second
rock target. That's where she will sample

5
00:00:20,900 --> 00:00:26,180
it with her drill. This second sample is intended
to confirm the results from her first drilling,

6
00:00:26,180 --> 00:00:30,960
which is where we found evidence of an ancient
environment favorable to microbial life.

7
00:00:30,960 --> 00:00:37,040
After drilling, Curiosity will process and
deliver the sample to her analytical instruments.

8
00:00:37,040 --> 00:00:41,320
A lot of you may have been wondering how we
get sample from the drill or the scoop into

9
00:00:41,320 --> 00:00:45,670
the instruments back in the rover.
So to collect the sample from the rock, we

10
00:00:45,670 --> 00:00:50,010
don't just\hpick up, drill into the rock and
drop off the sample directly. It's a little

11

00:00:50,010 --> 00:00:51,930
more complicated than that.

12
00:00:51,930 --> 00:00:55,399
Now we'll use this model of the drill bit
assembly to illustrate.

13
00:00:55,399 --> 00:01:01,251
As we drill the hole, the powder gets conveyed
up this tube and gets stored in the chamber

14
00:01:01,251 --> 00:01:03,390
inside the drill bit assembly.

15
00:01:03,390 --> 00:01:08,509
Then to move the powder out of the drill bit,
we use the robotic arm wrist and turret joint

16
00:01:08,509 --> 00:01:14,680
and the vibration caused by the drill percussion
mechanism to move the sample like so: Tap

17
00:01:14,680 --> 00:01:17,690
tap tap tap tap.

18
00:01:17,690 --> 00:01:23,150
We continue this motion to deliver it to the
CHIMRA, which is the sample, processing and

19
00:01:23,150 --> 00:01:25,900
delivery device.

20
00:01:25,900 --> 00:01:30,850
The drill sample comes up through the sample
transfer tube into the chambers into CHIMRA.

21
00:01:30,850 --> 00:01:37,560
As we open her up, we could see where the
sample comes in from the drill, then we would

22
00:01:37,560 --> 00:01:44,010
send the sample up to the scoop to take a
picture of it. Once we do that, we then move

23
00:01:44,010 --> 00:01:50,869
the sample through the sieve and into the
portion box to create a portion for the instruments

24
00:01:50,869 --> 00:01:57,280
inside the belly of Curiosity. And those portions
are the size of a baby aspirin tablet.

25
00:01:57,280 --> 00:02:00,890
To get the sample to the instruments is similar
to this puzzle game that I have on my phone,

26
00:02:00,890 --> 00:02:06,399
where we move the sample through a series
of chambers using gravity and vibration.\h\h

27
00:02:06,399 --> 00:02:10,289
Curiosity uses gravity instead of mechanisms
to move sample because there are fewer moving

28
00:02:10,289 --> 00:02:11,289
parts.

29
00:02:11,289 --> 00:02:16,400
So now I'll show you using these BBs in this
model - how we move the sample from the reservoir

30
00:02:16,400 --> 00:02:19,859
into the scoop:

31
00:02:19,859 --> 00:02:29,219
Rattle rattle rattle

32
00:02:29,219 --> 00:02:31,010
And there it is.\h

33
00:02:31,010 --> 00:02:33,269
Curiosity could do this a lot better than
I can.

34
00:02:33,269 --> 00:02:37,150
Now the sample is in the scoop. It still has
a long way to go to get into the sieve and

35
00:02:37,150 --> 00:02:40,980
into the portion box to be delivered into
SAM and CheMin in the belly of the rover.