1
00:00:10,790 --> 00:00:09,140
hi I'm Nathaniel Thompson and I'm Dan

2
00:00:13,789 --> 00:00:10,800
cota and this is your building curiosity

3
00:00:16,490 --> 00:00:13,799
update we're standing here in front of

4
00:00:18,140 --> 00:00:16,500
the large spin table this is the machine

5
00:00:20,570 --> 00:00:18,150
that we use to measure the mass

6
00:00:23,269 --> 00:00:20,580
properties of the Curiosity spacecraft

7
00:00:25,310 --> 00:00:23,279
mass properties describe the way an

8
00:00:27,529 --> 00:00:25,320
object moves through space there's three

9
00:00:30,320 --> 00:00:27,539
masts properties that we measure mass

10
00:00:33,200 --> 00:00:30,330
center of gravity and the rotational

11
00:00:35,479 --> 00:00:33,210
inertia the rotational inertia tell us

12
00:00:39,049 --> 00:00:35,489
how the matter is distributed and spread

13
00:00:42,319 --> 00:00:39,059

out it affects how easy it is to spin

14
00:00:45,139 --> 00:00:42,329
the object and also how the object will

15
00:00:47,240 --> 00:00:45,149
wobble as its spun during the cruise

16
00:00:50,209 --> 00:00:47,250
phase as we're flying through space to

17
00:00:53,090 --> 00:00:50,219
Mars the vehicle is rotating and it's

18
00:00:55,760 --> 00:00:53,100
using a camera star scanner to navigate

19
00:00:58,430 --> 00:00:55,770
by taking pictures of the stars if we're

20
00:01:00,410 --> 00:00:58,440
rotating and wobbling we can't get a

21
00:01:03,139 --> 00:01:00,420
good track on the stars and we won't be

22
00:01:05,119 --> 00:01:03,149
able to properly navigate we also use

23
00:01:07,760 --> 00:01:05,129
our antennas to communicate back with

24
00:01:10,789 --> 00:01:07,770
earth again if we're wobbling too much

25
00:01:13,280 --> 00:01:10,799
we can't correctly communicate with

26
00:01:15,230 --> 00:01:13,290
earth the principal over a rotational

27
00:01:16,700 --> 00:01:15,240
inertia test is very similar to the way

28
00:01:18,830 --> 00:01:16,710
you have your tires balanced at your

29
00:01:20,870 --> 00:01:18,840
local mechanic the mechanic will rotate

30
00:01:23,330 --> 00:01:20,880
the tires very quickly on a machine that

31
00:01:25,460 --> 00:01:23,340
measures the amount that it wobbles they

32
00:01:27,770 --> 00:01:25,470
will then put balancing weights on the

33
00:01:30,350 --> 00:01:27,780
tire until it spins smoothly this is

34
00:01:32,749 --> 00:01:30,360
exactly the way we spin and balance our

35
00:01:34,340 --> 00:01:32,759
spacecraft now we know what mass

36
00:01:37,010 --> 00:01:34,350
properties are how do we go about

37
00:01:39,649 --> 00:01:37,020
measuring them to do that we need a

38
00:01:41,300 --> 00:01:39,659

special machine called a spin table this

39
00:01:43,190 --> 00:01:41,310
is a miniature version of the large

40
00:01:46,190 --> 00:01:43,200
table that we use to measure our

41
00:01:48,830 --> 00:01:46,200
spacecraft the table floats on a cushion

42
00:01:51,469 --> 00:01:48,840
of air there are sensors inside the body

43
00:01:53,510 --> 00:01:51,479
of the table that measure the balance of

44
00:01:55,580 --> 00:01:53,520
the rover on top of the table kind of

45
00:01:59,060 --> 00:01:55,590
like a seesaw we've done a lot of

46
00:02:00,530 --> 00:01:59,070
testing already here at JPL now we're

47
00:02:02,810 --> 00:02:00,540
packing up our table and getting ready

48
00:02:04,639 --> 00:02:02,820
to ship it to Florida in Florida will be

49
00:02:06,980 --> 00:02:04,649
doing the most exciting test of all a

50
00:02:07,370 --> 00:02:06,990
full spacecraft with fuel loaded on the

51
00:02:09,139 --> 00:02:07,380
table

52
00:02:11,990 --> 00:02:09,149
measuring it to make sure it's ready for

53
00:02:14,240 --> 00:02:12,000
launch i'm nathaniel thompson and i'm