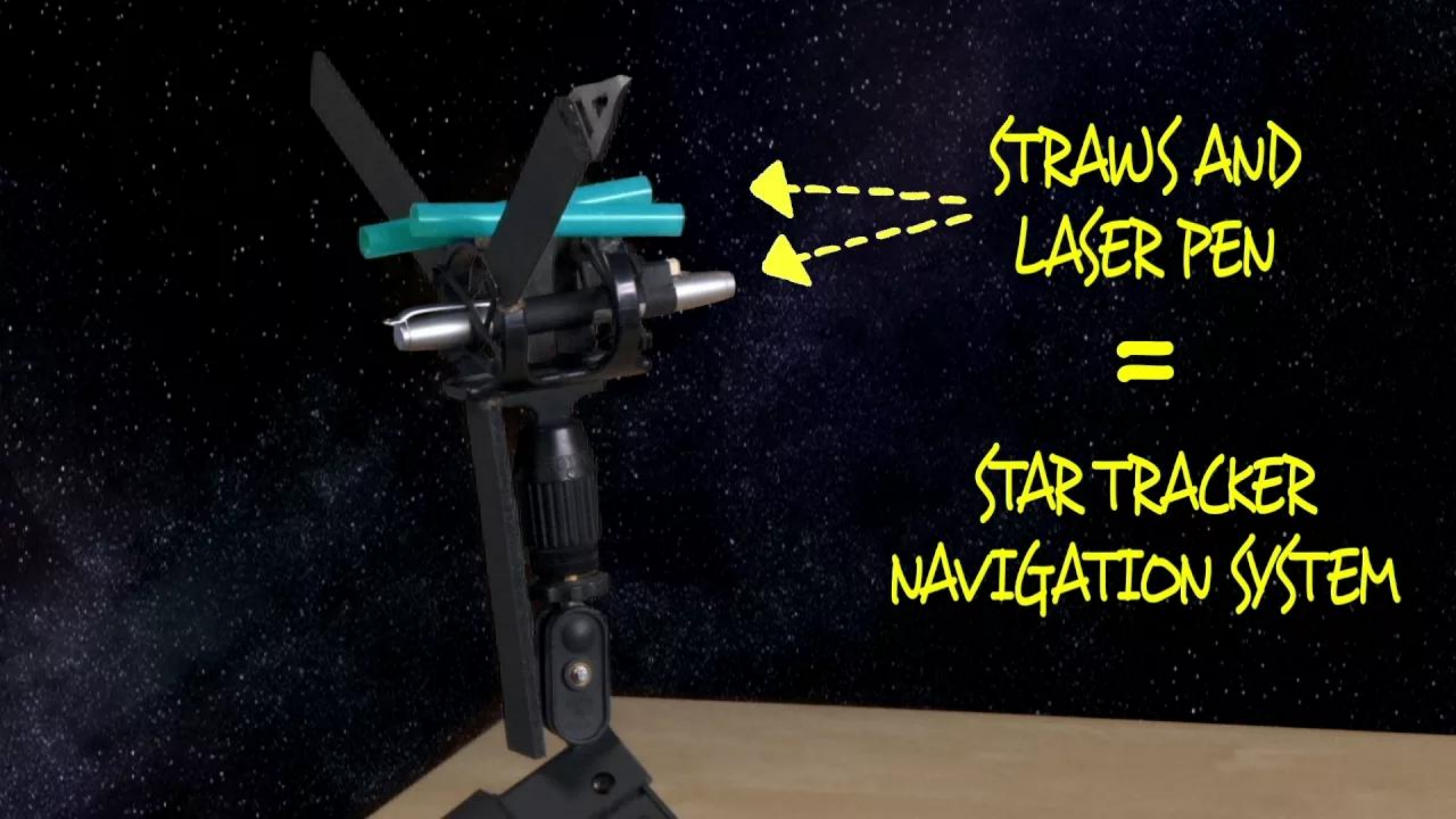
STRAWS AND
LASER PEN
=
STAR TRACKER
NAVIGATION SYSTEM

1
00:00:00,599 --> 00:00:02,368
(■)

2
00:00:02,401 --> 00:00:05,505
For centuries, humans
have found their way on the

3
00:00:05,538 --> 00:00:09,609
trackless oceans using
patterns of stars in the sky.

4
00:00:09,642 --> 00:00:12,478
Well, how will Juno find
its way to Jupiter

5
00:00:12,511 --> 00:00:15,715
in the trackless space of space?

6
00:00:15,748 --> 00:00:30,630
(■)

7
00:00:30,663 --> 00:00:33,132
In order to get the
Juno spacecraft

8
00:00:33,165 --> 00:00:34,500
in orbit around Jupiter

9
00:00:34,533 --> 00:00:38,704
we have to navigate it
precisely in deep space.

10
00:00:38,737 --> 00:00:41,808
So let's say this
little model represents

11
00:00:41,841 --> 00:00:45,511
the Juno spacecraft, and this
laser pointer and these two

12
00:00:45,544 --> 00:00:50,550
straws represent Juno's star
tracker navigation system.

13
00:00:52,284 --> 00:00:55,521
Cameras onboard Juno look for
a pattern of holiday lights

14
00:00:55,554 --> 00:00:56,789
in a black card.

15
00:00:56,822 --> 00:00:57,790
(record screeching sound)

16
00:00:57,823 --> 00:01:01,127
I mean, a pattern of
stars in deep space.

17
00:01:01,160 --> 00:01:03,896
And when it recognizes the
pattern that's been programmed

18
00:01:03,929 --> 00:01:07,533
into it by navigators here
on Earth, it causes the tiny

19
00:01:07,566 --> 00:01:12,105
rocket motors to steer
Juno precisely on course.

20
00:01:12,138 --> 00:01:16,075
Now, Juno doesn't wanna aim
right for Jupiter itself.

21
00:01:16,108 --> 00:01:20,379
You wanna get in
orbit around Jupiter.

22

00:01:20,412 --> 00:01:24,784
Now notice, even the slightest
disturbance in deep space

23
00:01:24,884 --> 00:01:26,119
(tap)

24
00:01:26,152 --> 00:01:27,787
will cause Juno to miss.

25
00:01:27,820 --> 00:01:30,223
It will miss Jupiter,
it will miss its orbit,

26
00:01:30,256 --> 00:01:32,992
and it will miss
it by that much.

27
00:01:33,092 --> 00:01:36,596
Now that much doesn't
seem like much here,

28
00:01:36,629 --> 00:01:40,233
but in deep space, that
much becomes hundreds of

29
00:01:40,266 --> 00:01:44,804
thousands of kilometers or
miles, or millions of leagues.