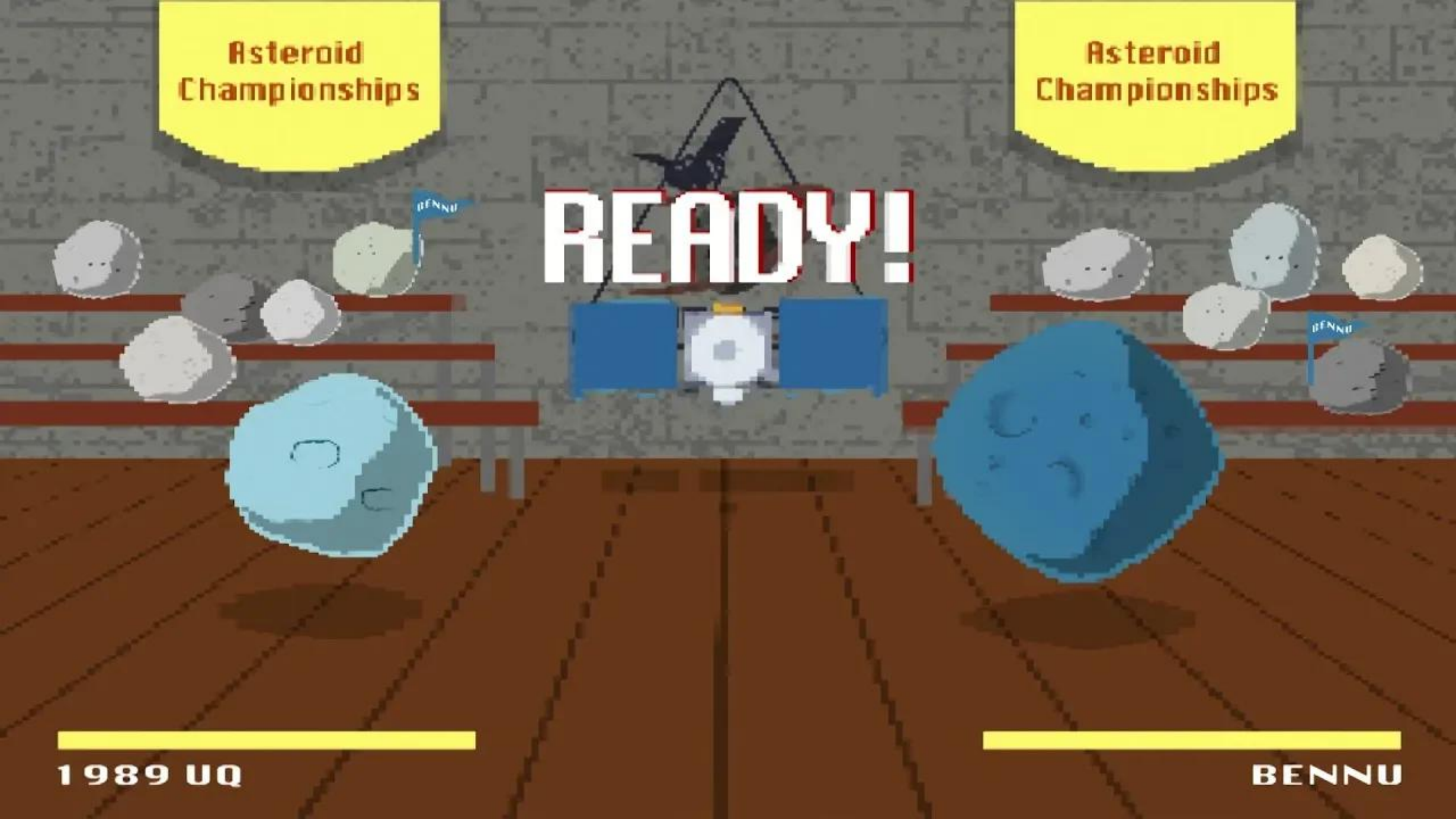
Asteroid Championships
Asteroid Championships
READY!
BENNU
BENNU
1989 UQ
BENNU

1
00:00:02,336 --> 00:00:05,205
The OSIRIS-REx spacecraft was
launched with a clear mission:

2
00:00:05,205 --> 00:00:07,975
collect a sample from an
asteroid called Bennu, and send

3
00:00:07,975 --> 00:00:11,011
it back to Earth. But with the
number of known asteroids in our

4
00:00:11,011 --> 00:00:13,947
solar system reaching into the
hundreds of thousands, why was

5
00:00:13,947 --> 00:00:18,585
Bennu chosen? What made it the
best target? The first set of

6
00:00:18,585 --> 00:00:22,489
selection criteria was proximity
to Earth. The most accessible

7
00:00:22,489 --> 00:00:27,895
asteroids are located around 74
to 153 million miles away. And

8
00:00:27,895 --> 00:00:30,564
in that group, the most ideal
targets are ones with an

9
00:00:30,564 --> 00:00:33,901
Earth-like circular orbit and a
low degree of tilt, due to

10
00:00:33,901 --> 00:00:38,322
spacecraft maneuverability. At
the time of selection in 2008,

11
00:00:38,322 --> 00:00:40,874
that brought the number of known
near-Earth objects down from

12
00:00:40,874 --> 00:00:45,696
seven-thousand to one-hundred
ninety-two. From there, the size

13
00:00:45,696 --> 00:00:48,799
of the asteroid became a factor.
Bigger meant better in this

14
00:00:48,799 --> 00:00:52,352
case, because asteroids with
smaller diameters rotate faster,

15
00:00:52,352 --> 00:00:55,656
and material on their surface
are more easily ejected. Not

16
00:00:55,656 --> 00:00:58,959
ideal conditions for safely
grabbing a sample. So, mission

17
00:00:58,959 --> 00:01:03,030
scientists wanted the target to
have a diameter larger than 200

18
00:01:03,030 --> 00:01:05,449
meters. That brought the
candidates down from one-hundred

19
00:01:05,449 --> 00:01:09,469
ninety-two to twenty-six. The
chemical composition of the

20
00:01:09,469 --> 00:01:12,506
asteroid was the next factor,
because we want our return

21
00:01:12,506 --> 00:01:15,092
sample to help us learn more
about the history of our solar

22
00:01:15,092 --> 00:01:18,845
system and life on Earth. That
dropped our target list to

23
00:01:18,845 --> 00:01:22,349
twelve asteroids with a known
composition. And from there,

24
00:01:22,349 --> 00:01:25,035
only five of those were ideal
for sampling because they are

25
00:01:25,035 --> 00:01:29,439
known from Earth observations to
be carbon-rich. This matters,

26
00:01:29,439 --> 00:01:33,010
because a carbon-rich asteroid
may contain organic molecules,

27
00:01:33,010 --> 00:01:36,113
volatiles, and amino acids that
may have been the precursors to

28
00:01:36,113 --> 00:01:40,350
life on Earth. So now it’s
decision time. Of these five

29
00:01:40,350 --> 00:01:44,121
contenders, why Bennu? Quite
simply, it’s because there was

30
00:01:44,121 --> 00:01:47,291
more information about it
available to scientists. It was

31
00:01:47,291 --> 00:01:50,661
the only object of the five that
had been observed with radar.

32
00:01:50,661 --> 00:01:53,046
This provided not just an
accurate measurement of its

33
00:01:53,046 --> 00:01:56,800
size, dimensions, and shape, but
also suggested it has a smooth

34
00:01:56,800 --> 00:01:59,987
surface with an ample amount of
material to sample, and few

35
00:01:59,987 --> 00:02:03,907
large boulders to get in the
way. We didn’t have this level

36
00:02:03,907 --> 00:02:06,827
of detail with the others, which
put the ability to safely get a

37
00:02:06,827 --> 00:02:11,264
surface sample in doubt. Sorry
fellas! The material we gather

38
00:02:11,264 --> 00:02:14,001
from asteroid Bennu will help
generations of scientists better

39
00:02:14,001 --> 00:02:16,653
understand how the planets
formed and the source of the

40
00:02:16,653 --> 00:02:20,507
organic materials and water that
helped spawn life on Earth. And

41
00:02:20,507 --> 00:02:23,760
beyond learning about the past,
studying Bennu can help us plan

42
00:02:23,760 --> 00:02:27,164
for the future – everything from
space travel, to utilizing

43
00:02:27,164 --> 00:02:30,017
natural resources, and better
understanding the risks of