

STEMonstrations



Iodinated
Water
(2-4 ppm iodine)

WATER FILTRATION

1
00:00:00,800 --> 00:00:15,248
[MUSIC]

2
00:00:19,819 --> 00:00:21,287
>> HI, I'M NASA ASTRONAUT

3
00:00:21,287 --> 00:00:22,222
DREW FEUSTEL.

4
00:00:22,222 --> 00:00:23,056
WELCOME TO THE INTERNATIONAL

5
00:00:23,056 --> 00:00:24,157
SPACE STATION.

6
00:00:24,157 --> 00:00:24,858
ON OUR STATION,

7
00:00:24,858 --> 00:00:25,892
OUR WATER RECOVERY SYSTEM

8
00:00:25,892 --> 00:00:27,360
IS VITAL TO OUR MISSION

9
00:00:27,360 --> 00:00:28,928
AND OUR SURVIVAL.

10
00:00:28,928 --> 00:00:30,096
WANT TO KNOW WHY AND HOW

11
00:00:30,096 --> 00:00:31,965
WE RECYCLE AND FILTER OUR WATER?

12
00:00:31,965 --> 00:00:33,533
LET'S GO.

13
00:00:37,337 --> 00:00:38,271

WE USE WATER RECOVERY

14

00:00:38,271 --> 00:00:39,472
AND FILTRATION BECAUSE

15

00:00:39,472 --> 00:00:40,573
IT IS EXPENSIVE TO LAUNCH

16

00:00:40,573 --> 00:00:42,075
RESUPPLY MISSIONS.

17

00:00:42,075 --> 00:00:42,842
AND THE WEIGHT OF THE WATER

18

00:00:42,842 --> 00:00:44,444
IS A PROBLEM AS WELL.

19

00:00:44,444 --> 00:00:45,712
THINK ABOUT THE WEIGHT OF

20

00:00:45,712 --> 00:00:47,414
A SINGLE BUCKET OF WATER.

21

00:00:47,414 --> 00:00:48,348
CAN YOU IMAGINE THE WEIGHT

22

00:00:48,348 --> 00:00:50,517
OF WATER FOR A MONTH'S SUPPLY

23

00:00:50,517 --> 00:00:51,785
FOR SIX PEOPLE ON

24

00:00:51,785 --> 00:00:53,353
THE INTERNATIONAL SPACE STATION?

25

00:00:53,353 --> 00:00:54,154
WHAT ABOUT THE WATER

26

00:00:54,154 --> 00:00:55,088

FOR A YEAR OR MORE

27

00:00:55,088 --> 00:00:56,489

WHEN WE LEAVE LOW EARTH ORBIT

28

00:00:56,489 --> 00:00:58,425

FOR DEEPER SPACE MISSIONS?

29

00:00:58,425 --> 00:00:59,893

THAT'S A LOT OF WATER,

30

00:00:59,893 --> 00:01:00,827

AND BRINGING IT WITH US

31

00:01:00,827 --> 00:01:02,762

IS NOT VERY EFFICIENT.

32

00:01:02,762 --> 00:01:04,497

ON STATION, WE RECYCLE

33

00:01:04,497 --> 00:01:05,365

WASTE WATER TO GET

34

00:01:05,365 --> 00:01:06,900

FRESH DRINKING WATER.

35

00:01:06,900 --> 00:01:08,168

THIS RECOVERY AND FILTRATION

36

00:01:08,168 --> 00:01:10,136

PROCESS INCLUDES OUR URINE,

37

00:01:10,136 --> 00:01:11,371

THE MOISTURE WE EXHALE,

38

00:01:11,371 --> 00:01:13,406

AND SWEAT, ALONG WITH

39

00:01:13,406 --> 00:01:14,374

THE WATER WE USE

40

00:01:14,374 --> 00:01:16,276

TO BATHE AND SHAVE.

41

00:01:16,276 --> 00:01:17,644

IT WORKS LIKE THIS.

42

00:01:17,644 --> 00:01:19,012

WHEN WE USE THE BATHROOM,

43

00:01:19,012 --> 00:01:20,880

URINE IS COLLECTED AND PUMPED

44

00:01:20,880 --> 00:01:22,749

TO A DISTILLATION ASSEMBLY.

45

00:01:22,749 --> 00:01:23,950

THE ASSEMBLY SPINS,

46

00:01:23,950 --> 00:01:26,286

PULLING THE URINE TO ITS WALLS.

47

00:01:26,286 --> 00:01:27,353

THE URINE IS HEATED

48

00:01:27,353 --> 00:01:28,421

TO EVAPORATE WATER FROM

49

00:01:28,421 --> 00:01:30,190

THE WASTE, AND THEN CONDENSED

50

00:01:30,190 --> 00:01:31,424

IN THE OUTER CHAMBER

51
00:01:31,424 --> 00:01:33,293
TO FORM DISTILLATE.

52
00:01:33,293 --> 00:01:35,228
NEXT, THE WATER IS PUMPED

53
00:01:35,228 --> 00:01:36,496
TO A TANK WHERE IT IS JOINED

54
00:01:36,496 --> 00:01:37,831
WITH THE WATER RECOVERED FROM

55
00:01:37,831 --> 00:01:39,399
CABIN AIR CREATED BY

56
00:01:39,399 --> 00:01:41,734
CREW SWEAT AND RESPIRATION.

57
00:01:41,734 --> 00:01:43,102
DOWN THE LINE FROM THERE,

58
00:01:43,102 --> 00:01:44,971
ODORS AND ANY OTHER CONTAMINANTS

59
00:01:44,971 --> 00:01:46,773
ARE REMOVED WITH HEAT.

60
00:01:46,773 --> 00:01:47,874
THEN IODINE IS ADDED

61
00:01:47,874 --> 00:01:50,777
FOR MICROBIAL CONTROL.

62
00:01:50,777 --> 00:01:51,678
OUR WATER IS CHECKED OFTEN

63
00:01:51,678 --> 00:01:52,512

TO ENSURE IT MEETS

64

00:01:52,512 --> 00:01:54,280

WATER QUALITY REQUIREMENT.

65

00:01:54,280 --> 00:01:55,748

IT IS ALSO MONITORED CLOSELY

66

00:01:55,748 --> 00:01:57,183

FOR BACTERIA, POLLUTANTS,

67

00:01:57,183 --> 00:01:59,152

AND PROPER pH.

68

00:01:59,152 --> 00:02:00,487

THE pH SCALE RANGES FROM

69

00:02:00,487 --> 00:02:03,189

0 TO 14, AND IS A TOOL USED

70

00:02:03,189 --> 00:02:04,390

BY SCIENTISTS TO MEASURE

71

00:02:04,390 --> 00:02:05,758

THE STRENGTH OF AN ACID

72

00:02:05,758 --> 00:02:06,993

OR A BASE.

73

00:02:06,993 --> 00:02:08,094

OUR WATER IS REQUIRED TO BE

74

00:02:08,094 --> 00:02:11,731

IN THE 6.0 TO 8.5 RANGE.

75

00:02:11,731 --> 00:02:12,866

THE END RESULT OF THE ENTIRE

76
00:02:12,866 --> 00:02:14,434
PROCESS IS CLEAN DRINKING WATER

77
00:02:14,434 --> 00:02:16,236
THAT WE GET TO ENJOY

78
00:02:16,236 --> 00:02:18,471
EVERY DAY.

79
00:02:18,471 --> 00:02:19,973
THE RECYCLED WATER ON

80
00:02:19,973 --> 00:02:21,241
THE SPACE STATION IS STERILE.

81
00:02:21,241 --> 00:02:23,476
THERE'S NO ODOR OR BAD TASTE.

82
00:02:23,476 --> 00:02:24,244
YOU'VE SEEN THAT

83
00:02:24,244 --> 00:02:25,345
WATER RECYCLING IS CRITICAL

84
00:02:25,345 --> 00:02:26,713
FOR LONG DURATION MISSIONS

85
00:02:26,713 --> 00:02:27,514
SUCH AS HERE ON

86
00:02:27,514 --> 00:02:28,381
THE SPACE STATION,

87
00:02:28,381 --> 00:02:29,382
AND WILL BE FOR FUTURE TRIPS

88
00:02:29,382 --> 00:02:30,583

TO THE MOON OR MARS.

89

00:02:30,583 --> 00:02:31,651

BE SURE TO CHECK OUT

90

00:02:31,651 --> 00:02:32,952

THE ACTIVITY CONNECTED TO

91

00:02:32,952 --> 00:02:34,420

THIS VIDEO SO YOU CAN LEARN

92

00:02:34,420 --> 00:02:36,389

MORE ABOUT WATER FILTRATION.

93

00:02:36,389 --> 00:02:37,590

THANKS FOR LEARNING WITH ME,