

STEMonstrations



**SLEEP
SCIENCE**



1
00:00:00,767 --> 00:00:15,181
[MUSIC]

2
00:00:16,015 --> 00:00:16,850
>> HI, MY NAME'S RICKY ARNOLD

3
00:00:16,850 --> 00:00:17,617
ON THE INTERNATIONAL

4
00:00:17,617 --> 00:00:19,152
SPACE STATION.

5
00:00:19,152 --> 00:00:20,520
WE GET ASKED A LOT

6
00:00:20,520 --> 00:00:22,355
HOW DO WE SLEEP IN SPACE.

7
00:00:22,355 --> 00:00:23,390
AND IT'S A GREAT QUESTION,

8
00:00:23,390 --> 00:00:24,090
BECAUSE WE ALL KNOW

9
00:00:24,090 --> 00:00:25,291
HOW IMPORTANT A GOOD NIGHT'S

10
00:00:25,291 --> 00:00:26,393
SLEEP IS.

11
00:00:26,393 --> 00:00:27,527
UM, IF YOU'RE NOT GETTIN'

12
00:00:27,527 --> 00:00:28,528
A GOOD NIGHT'S SLEEP,

13
00:00:28,528 --> 00:00:29,629

YOU CAN COUNT ON REDUCED

14

00:00:29,629 --> 00:00:31,131
COGNITIVE FUNCTION,

15

00:00:31,131 --> 00:00:32,599
POORER REACTION TIMES,

16

00:00:32,599 --> 00:00:33,466
AND MAYBE JUST BEING

17

00:00:33,466 --> 00:00:34,501
A LITTLE GRUMPY.

18

00:00:34,501 --> 00:00:35,368
AND UP HERE IN SPACE,

19

00:00:35,368 --> 00:00:36,503
JUST LIKE ON EARTH,

20

00:00:36,503 --> 00:00:37,370
THOSE ARE THINGS

21

00:00:37,370 --> 00:00:38,838
WE ALL WANNA AVOID.

22

00:00:38,838 --> 00:00:40,507
SO WE GO AROUND THE EARTH

23

00:00:40,507 --> 00:00:42,108
ABOUT EVERY 90 MINUTES,

24

00:00:42,108 --> 00:00:44,110
WHICH MEANS WE GET 16 SUNRISES

25

00:00:44,110 --> 00:00:45,779
AND SUNSETS A DAY.

26

00:00:45,779 --> 00:00:46,813

SO HOW WE SLEEP IS

27

00:00:46,813 --> 00:00:48,481

A REALLY GOOD QUESTION.

28

00:00:48,481 --> 00:00:49,649

BECAUSE THE SUN'S ALWAYS

29

00:00:49,649 --> 00:00:50,450

GETTIN' READY TO COME UP,

30

00:00:50,450 --> 00:00:51,484

OR IT'S GETTIN' READY TO SET,

31

00:00:51,484 --> 00:00:53,420

AND WE USE THOSE CUES ON EARTH

32

00:00:53,420 --> 00:00:54,654

TO LET US KNOW WHEN IT'S TIME

33

00:00:54,654 --> 00:00:55,855

TO BEGIN OUR DAY AND

34

00:00:55,855 --> 00:00:57,857

WHEN IT'S TIME TO END OUR DAY.

35

00:00:57,857 --> 00:00:58,992

>> RICKY IS TALKING ABOUT

36

00:00:58,992 --> 00:01:00,393

CIRCADIAN RHYTHM.

37

00:01:00,393 --> 00:01:01,361

IT'S THE BODY'S NATURAL

38

00:01:01,361 --> 00:01:02,362

REGULATOR FOR SLEEP

39

00:01:02,362 --> 00:01:03,530
AND WAKE CYCLES BASED ON

40

00:01:03,530 --> 00:01:05,498
A 24-HOUR SCHEDULE.

41

00:01:05,498 --> 00:01:07,233
THOSE 16 SUNRISES AND SUNSETS

42

00:01:07,233 --> 00:01:08,201
HE MENTIONED CAN CAUSE

43

00:01:08,201 --> 00:01:09,569
CIRCADIAN MISALIGNMENT

44

00:01:09,569 --> 00:01:10,670
AND SLEEP DEFICIENCIES DURING

45

00:01:10,670 --> 00:01:12,505
LONG DURATION SPACE FLIGHT.

46

00:01:12,505 --> 00:01:13,873
THE HAZARDS OF LOST SLEEP

47

00:01:13,873 --> 00:01:15,241
CAN RANGE FROM POOR ATTENTION

48

00:01:15,241 --> 00:01:17,010
AT SCHOOL TO ON-THE-JOB ERRORS,

49

00:01:17,010 --> 00:01:18,578
TO LONG TERM SLEEP LOSS--

50

00:01:18,578 --> 00:01:20,346
EVEN CHRONIC DISEASE.

51
00:01:20,346 --> 00:01:22,148
SLEEP IS SUPER IMPORTANT.

52
00:01:22,148 --> 00:01:23,750
HEY, RICKY, WHAT ARE YOU DOING

53
00:01:23,750 --> 00:01:24,717
ON THE SPACE STATION

54
00:01:24,717 --> 00:01:27,153
TO GET SOME SLEEP?

55
00:01:27,153 --> 00:01:27,921
>> WELL, HERE IN SPACE,

56
00:01:27,921 --> 00:01:28,721
WE KINDA HAVE TO DO IT

57
00:01:28,721 --> 00:01:29,989
ARTIFICIALLY, SO WE HAVE

58
00:01:29,989 --> 00:01:31,558
THESE NICE CREW QUARTERS.

59
00:01:31,558 --> 00:01:32,459
IT'S ABOUT THE SIZE OF

60
00:01:32,459 --> 00:01:33,893
A REFRIGERATOR.

61
00:01:33,893 --> 00:01:35,195
IT'S VERY QUIET.

62
00:01:35,195 --> 00:01:36,429
UH, THE SPACE STATION CAN BE

63
00:01:36,429 --> 00:01:37,263

A LITTLE NOISY, BUT

64

00:01:37,263 --> 00:01:39,065

IT'S VERY QUIET IN HERE.

65

00:01:39,065 --> 00:01:41,468

UM, AND WE CAN CONTROL LIGHT

66

00:01:41,468 --> 00:01:43,269

WITH A LIGHT SWITCH.

67

00:01:43,269 --> 00:01:44,337

IF WE, UH, ARE JUST

68

00:01:44,337 --> 00:01:45,205

MIDDLE OF THE DAY, WE HAVE

69

00:01:45,205 --> 00:01:46,339

OUR LIGHTS, A LIGHT LIKE

70

00:01:46,339 --> 00:01:47,373

YOU'RE SEEIN' RIGHT NOW,

71

00:01:47,373 --> 00:01:48,174

WHICH IS JUST THIS KIND OF

72

00:01:48,174 --> 00:01:50,343

STANDARD LIGHTING.

73

00:01:50,343 --> 00:01:51,311

IF IT'S GETTIN' CLOSE TO

74

00:01:51,311 --> 00:01:52,212

THE END OF THE EVENING,

75

00:01:52,212 --> 00:01:53,346

YOU WANNA DIM THE LIGHT

76

00:01:53,346 --> 00:01:55,148

A LITTLE BIT, KINDA

77

00:01:55,148 --> 00:01:56,449

FOR THE END OF THE EVENING.

78

00:01:56,449 --> 00:01:57,450

OR IF YOU'RE GONNA BE UP LATE

79

00:01:57,450 --> 00:01:59,118

AND YOU NEED TO KEEP AWAKE,

80

00:01:59,118 --> 00:01:59,853

WE HAVE A REALLY BRIGHT

81

00:01:59,853 --> 00:02:01,488

LIGHT SETTING.

82

00:02:01,488 --> 00:02:03,189

THE OTHER THING WE HAVE IS--

83

00:02:03,189 --> 00:02:05,425

OFF.

84

00:02:05,425 --> 00:02:07,160

YOU SEE HOW DARK IT GOT.

85

00:02:07,160 --> 00:02:08,862

UM, ANOTHER CHALLENGE SLEEPING

86

00:02:08,862 --> 00:02:09,696

ON THE INTERNATIONAL

87

00:02:09,696 --> 00:02:10,497

SPACE STATION-- SLEEPING

88

00:02:10,497 --> 00:02:12,398

IN MICROGRAVITY'S REALLY NICE,

89

00:02:12,398 --> 00:02:13,399

BECAUSE YOU CAN JUST FLOAT

90

00:02:13,399 --> 00:02:14,501

AND STRETCH OUT, AND

91

00:02:14,501 --> 00:02:16,002

IT'S REALLY COMFORTABLE.

92

00:02:16,002 --> 00:02:17,070

THE PROBLEM IS WITH THE AIR

93

00:02:17,070 --> 00:02:18,071

CURRENTS IN THE INTERNATIONAL

94

00:02:18,071 --> 00:02:19,372

SPACE STATION, YOU COULD

95

00:02:19,372 --> 00:02:20,707

VERY WELL FLOAT INTO A PIECE

96

00:02:20,707 --> 00:02:22,342

OF HARDWARE AND HIT YOUR HEAD,

97

00:02:22,342 --> 00:02:23,276

OR WORSE YET, EVEN

98

00:02:23,276 --> 00:02:24,511

BREAK SOMETHING.

99

00:02:24,511 --> 00:02:26,446

SO WE GOT OUR SLEEPING BAG HERE,

100

00:02:26,446 --> 00:02:27,514

JUST ALMOST LIKE A SLEEPING BAG

101
00:02:27,514 --> 00:02:29,949
ON EARTH, BUT AS YOU CAN SEE,

102
00:02:29,949 --> 00:02:31,317
WE HAVE BUNGEE CORDS THAT HELP

103
00:02:31,317 --> 00:02:32,552
HOLD US UP AGAINST THE WALL.

104
00:02:32,552 --> 00:02:34,521
SO I ALMOST SLEEP STANDING UP.

105
00:02:34,521 --> 00:02:36,523
AND ALSO, I DO HAVE A PILLOW,

106
00:02:36,523 --> 00:02:37,690
WHICH IS JUST A BAG FULL OF,

107
00:02:37,690 --> 00:02:39,559
UH, OF CLOTHES, BUT I ACTUALLY

108
00:02:39,559 --> 00:02:40,827
KEEP IT UP ON THE TOP OF MY HEAD

109
00:02:40,827 --> 00:02:42,295
BECAUSE I'M A LITTLE TALL,

110
00:02:42,295 --> 00:02:43,162
AND THE CREW QUARTERS,

111
00:02:43,162 --> 00:02:44,030
I TEND TO HIT MY HEAD ON

112
00:02:44,030 --> 00:02:46,266
THE CEILING WHEN I'M SLEEPING.

113
00:02:46,266 --> 00:02:47,867

SO I GOT MY SLEEPING BAG HERE.

114

00:02:47,867 --> 00:02:48,868

I GOT MY BUNGEE CORDS

115

00:02:48,868 --> 00:02:49,969

TO HOLD ME IN.

116

00:02:49,969 --> 00:02:50,670

AND THEN WHEN IT'S TIME

117

00:02:50,670 --> 00:02:51,938

TO GO TO BED, IT'S QUITE EASY.

118

00:02:51,938 --> 00:02:54,541

JUST UNZIP THE SLEEPING BAG.

119

00:02:54,541 --> 00:02:58,077

CLIMB ON UNDER THE BUNGEE CORD.

120

00:02:58,077 --> 00:03:02,615

CLIMB INTO THE SLEEPING BAG.

121

00:03:02,615 --> 00:03:03,483

MAKE SURE YOU'RE NICE

122

00:03:03,483 --> 00:03:07,854

AND SECURE.

123

00:03:07,854 --> 00:03:09,822

ZIP YOURSELF UP.

124

00:03:09,822 --> 00:03:10,723

PLAN ON GETTING A GOOD NIGHT'S

125

00:03:10,723 --> 00:03:12,125

SLEEP, SO I HAVE GOOD REACTION

126

00:03:12,125 --> 00:03:13,860

TIMES, MY COGNITIVE ABILITY IS

127

00:03:13,860 --> 00:03:15,428

WHAT IT SHOULD BE, AND THAT

128

00:03:15,428 --> 00:03:17,196

I'M NOT GRUMPY IN THE MORNING.

129

00:03:17,196 --> 00:03:19,899

SO WITH THAT, I'M ALL SET.