



1
00:00:04,390 --> 00:00:01,829
oh it's a privilege

2
00:00:05,910 --> 00:00:04,400
please call me tom

3
00:00:07,829 --> 00:00:05,920
tom thank you i call you vic and the

4
00:00:10,230 --> 00:00:07,839
privilege is mine it's so amazing to

5
00:00:11,749 --> 00:00:10,240
meet you even virtually

6
00:00:14,230 --> 00:00:11,759
it's great to meet you

7
00:00:16,390 --> 00:00:14,240
congratulations on your extraordinary

8
00:00:20,070 --> 00:00:16,400
career thus far it's really what you've

9
00:00:22,230 --> 00:00:20,080
accomplished i have great admiration for

10
00:00:24,150 --> 00:00:22,240
well thank you and you know i uh the

11
00:00:26,310 --> 00:00:24,160
movie top gun obviously had a huge

12
00:00:28,150 --> 00:00:26,320
impact on me and as much as i want to

13
00:00:30,070 --> 00:00:28,160

throw top gun quotes at you i won't i'm

14

00:00:32,950 --> 00:00:30,080

sure you get a lot of that so thank you

15

00:00:34,870 --> 00:00:32,960

because you had a part in that

16

00:00:36,310 --> 00:00:34,880

boy that's it's an honor for me and i

17

00:00:37,910 --> 00:00:36,320

can't wait for you to see the next one

18

00:00:39,750 --> 00:00:37,920

top gun maverick

19

00:00:42,229 --> 00:00:39,760

i can't wait oh i can't wait

20

00:00:45,990 --> 00:00:44,549

i'm ready to show it to you i can't wait

21

00:00:48,229 --> 00:00:46,000

man

22

00:00:50,310 --> 00:00:48,239

awesome so listen i have a few questions

23

00:00:52,389 --> 00:00:50,320

for you if you don't mind

24

00:00:54,630 --> 00:00:52,399

yes sir let's do it tom because

25

00:00:56,950 --> 00:00:54,640

obviously you've flown

26

00:00:59,029 --> 00:00:56,960

i guess 40 aircraft over as a test pilot

27

00:01:01,270 --> 00:00:59,039

many different aircrafts the f-18 it's a

28

00:01:04,070 --> 00:01:01,280

naval aviator test pilot

29

00:01:05,670 --> 00:01:04,080

now flying the dragon spacex dragon how

30

00:01:07,990 --> 00:01:05,680

does that compare to that and what do

31

00:01:10,789 --> 00:01:08,000

you think for yourself what was the most

32

00:01:13,670 --> 00:01:10,799

exhilarating aspect

33

00:01:15,510 --> 00:01:13,680

awesome you know the the dragon is uh a

34

00:01:17,350 --> 00:01:15,520

touchscreen the displays are also where

35

00:01:19,350 --> 00:01:17,360

the controls are and so that's quite

36

00:01:21,510 --> 00:01:19,360

different than flying an aircraft with a

37

00:01:23,190 --> 00:01:21,520

stick and a throttle and so when i first

38

00:01:24,870 --> 00:01:23,200

saw it i will be honest with you i was

39

00:01:26,630 --> 00:01:24,880

like i don't know guys i need my

40

00:01:27,670 --> 00:01:26,640

inceptors i need something to move

41

00:01:29,429 --> 00:01:27,680

around

42

00:01:31,270 --> 00:01:29,439

but as i learned more about what the

43

00:01:33,670 --> 00:01:31,280

vehicle does and what it what its

44

00:01:35,990 --> 00:01:33,680

purpose was the touchscreen actually was

45

00:01:38,630 --> 00:01:36,000

wonderful it worked great and uh the

46

00:01:41,109 --> 00:01:38,640

most exhilarating part of it all was

47

00:01:43,749 --> 00:01:41,119

riding the the falcon 9 rocket it is

48

00:01:46,069 --> 00:01:43,759

such a high performing liquid rocket

49

00:01:48,230 --> 00:01:46,079

it's smooth but it really left off the

50

00:01:50,310 --> 00:01:48,240

pad and we got to the 100 kilometer

51
00:01:52,630 --> 00:01:50,320
point and we were all smiles it was just

52
00:01:54,789 --> 00:01:52,640
so amazing you can really feel the

53
00:01:56,550 --> 00:01:54,799
accelerations and decelerations and then

54
00:01:58,950 --> 00:01:56,560
once we got onto the upper stage the

55
00:02:00,630 --> 00:01:58,960
second stage and you just start building

56
00:02:02,550 --> 00:02:00,640
speed it was

57
00:02:05,270 --> 00:02:02,560
i've pulled g's before in fighter

58
00:02:07,830 --> 00:02:05,280
aircraft but to be able to pull g's for

59
00:02:09,589 --> 00:02:07,840
almost 10 minutes straight was just

60
00:02:12,309 --> 00:02:09,599
power like i've never experienced not

61
00:02:13,750 --> 00:02:12,319
even launching or landing on a carrier

62
00:02:16,229 --> 00:02:13,760
really

63
00:02:18,630 --> 00:02:16,239

i've been fortunate i've i've i've got

64

00:02:20,070 --> 00:02:18,640

some launches and i landed on carriers

65

00:02:21,350 --> 00:02:20,080

on the roosevelt

66

00:02:22,790 --> 00:02:21,360

and uh

67

00:02:24,229 --> 00:02:22,800

that kind of geez that kind of force

68

00:02:26,550 --> 00:02:24,239

coming off there is pretty incredible

69

00:02:28,309 --> 00:02:26,560

what was it like in the with the dragon

70

00:02:30,150 --> 00:02:28,319

what what would it feel like with the

71

00:02:33,030 --> 00:02:30,160

falcon 9 i mean how many g's were you

72

00:02:35,270 --> 00:02:33,040

pulling and i know you're laying down

73

00:02:37,110 --> 00:02:35,280

yes what was that so it is different

74

00:02:39,030 --> 00:02:37,120

in the fighter the g's go from your head

75

00:02:41,350 --> 00:02:39,040

to your toe and that's why we practice

76

00:02:42,869 --> 00:02:41,360

these specific uh maneuvers to to keep

77

00:02:44,470 --> 00:02:42,879

blood flow to your brain so you stay

78

00:02:47,830 --> 00:02:44,480

conscious and you don't gray out or

79

00:02:49,830 --> 00:02:47,840

black out the g in in on a rocket launch

80

00:02:52,309 --> 00:02:49,840

goes into your chest and so you are you

81

00:02:54,790 --> 00:02:52,319

naturally can can uh sustain more g's in

82

00:02:56,949 --> 00:02:54,800

that direction and and the g is actually

83

00:02:59,030 --> 00:02:56,959

lower so the maximum g we saw was about

84

00:03:01,270 --> 00:02:59,040

four and a half but what's different in

85

00:03:03,190 --> 00:03:01,280

a fighter you'll experience i pulled the

86

00:03:05,589 --> 00:03:03,200

nine g's in a fighter aircraft but that

87

00:03:08,149 --> 00:03:05,599

was only for seconds and you know i've

88

00:03:10,309 --> 00:03:08,159

sustained so three to four g's for maybe

89

00:03:13,110 --> 00:03:10,319

a minute or a minute and a half in a

90

00:03:15,589 --> 00:03:13,120

dogfight in a turning fight but on the

91

00:03:17,670 --> 00:03:15,599

falcon but except for staging and

92

00:03:20,390 --> 00:03:17,680

throttle down you are accelerating the

93

00:03:21,990 --> 00:03:20,400

entire way for about nine minutes it was

94

00:03:23,589 --> 00:03:22,000

about eight minutes and fifty or so

95

00:03:26,229 --> 00:03:23,599

seconds i mean and you're accelerating

96

00:03:29,589 --> 00:03:26,239

the entire way because you wind up 200

97

00:03:31,830 --> 00:03:29,599

kilometers above the earth going 17 000

98

00:03:34,070 --> 00:03:31,840

miles per hour it's an amazing amount of

99

00:03:36,470 --> 00:03:34,080

power and so we we actually were above

100

00:03:37,430 --> 00:03:36,480

three and a half g's for about three

101
00:03:39,750 --> 00:03:37,440
minutes

102
00:03:41,350 --> 00:03:39,760
that's what's amazing

103
00:03:44,309 --> 00:03:41,360
that's incredible

104
00:03:45,990 --> 00:03:44,319
that is absolutely incredible

105
00:03:47,270 --> 00:03:46,000
i know i've have i've been fortunate you

106
00:03:50,470 --> 00:03:47,280
know of different aircraft that i've

107
00:03:52,470 --> 00:03:50,480
flown as is those g's and feeling them

108
00:03:54,070 --> 00:03:52,480
momentarily nine and a half is what i

109
00:03:56,309 --> 00:03:54,080
pulled actually in the f-14 the first

110
00:03:58,149 --> 00:03:56,319
top gun you know from when we got nine

111
00:03:59,670 --> 00:03:58,159
and a half and we uh

112
00:04:01,350 --> 00:03:59,680
you know in the new one we were pulling

113
00:04:03,350 --> 00:04:01,360

a lot of different g's but to sustain

114

00:04:04,789 --> 00:04:03,360

that i was i was wondering because i

115

00:04:06,470 --> 00:04:04,799

always wanted to know what that rocket

116

00:04:08,789 --> 00:04:06,480

and feeling that acceleration where you

117

00:04:10,470 --> 00:04:08,799

could actually feel that acceleration

118

00:04:12,390 --> 00:04:10,480

the whole time do you felt that the

119

00:04:14,630 --> 00:04:12,400

whole time lauration on the body

120

00:04:16,229 --> 00:04:14,640

the whole time the whole time

121

00:04:18,949 --> 00:04:16,239

yes you know coming off the pad

122

00:04:21,110 --> 00:04:18,959

initially it feels like uh a very high

123

00:04:23,030 --> 00:04:21,120

speed elevator you know the first the

124

00:04:24,710 --> 00:04:23,040

first move off the pad you're not going

125

00:04:26,629 --> 00:04:24,720

very fast and you're actually not

126
00:04:28,629 --> 00:04:26,639
accelerating very fast but it just

127
00:04:30,390 --> 00:04:28,639
continues to pick up i mean the entire

128
00:04:32,469 --> 00:04:30,400
time you're moving and at about one

129
00:04:34,469 --> 00:04:32,479
minute into the flight uh you get to

130
00:04:36,950 --> 00:04:34,479
you're in the region of maximum dynamic

131
00:04:38,469 --> 00:04:36,960
pressure what you hear people say max q

132
00:04:40,390 --> 00:04:38,479
and that's where you're in the thickest

133
00:04:41,990 --> 00:04:40,400
part of the air down low but you're also

134
00:04:44,230 --> 00:04:42,000
going really fast and that could

135
00:04:45,909 --> 00:04:44,240
actually crumple the the rocket and the

136
00:04:47,990 --> 00:04:45,919
spacecraft so they actually slow down

137
00:04:49,670 --> 00:04:48,000
they throttle the rocket down and you

138
00:04:51,909 --> 00:04:49,680

feel that you feel yourself it's like

139

00:04:53,830 --> 00:04:51,919

tapping the brakes and then really what

140

00:04:55,990 --> 00:04:53,840

stands out is the throttle up then they

141

00:04:57,270 --> 00:04:56,000

go back to full power and when they do

142

00:04:59,749 --> 00:04:57,280

that it felt like lighting the

143

00:05:01,270 --> 00:04:59,759

afterburner in an f-18 i wish i would

144

00:05:03,670 --> 00:05:01,280

have been able to feel what it was like

145

00:05:05,670 --> 00:05:03,680

in an f-14 because i hear it is quite

146

00:05:07,670 --> 00:05:05,680

impressive but i never got to fly that

147

00:05:09,670 --> 00:05:07,680

aircraft but you definitely feel it the

148

00:05:11,270 --> 00:05:09,680

entire way up and then the first stage

149

00:05:13,110 --> 00:05:11,280

shuts down after about two and a half

150

00:05:15,189 --> 00:05:13,120

minutes and then we ride the second

151

00:05:17,670 --> 00:05:15,199

stage all the way into orbit and that

152

00:05:19,749 --> 00:05:17,680

one starts just at about one g and so

153

00:05:22,070 --> 00:05:19,759

again it's a very light push but then

154

00:05:23,830 --> 00:05:22,080

you push for another six minutes and

155

00:05:25,909 --> 00:05:23,840

about half of that time you're above

156

00:05:28,150 --> 00:05:25,919

three g's and so your chest is very

157

00:05:30,469 --> 00:05:28,160

heavy and you have to focus on breathing

158

00:05:31,670 --> 00:05:30,479

inhale and then the exhale kind of works

159

00:05:33,830 --> 00:05:31,680

itself out you know because of the

160

00:05:35,749 --> 00:05:33,840

pressure it is quite amazing it was a

161

00:05:37,510 --> 00:05:35,759

truly incredible experience

162

00:05:38,629 --> 00:05:37,520

i did not know you had to work on that

163

00:05:43,990 --> 00:05:38,639

that

164

00:05:45,430 --> 00:05:44,000

now being a nasa astronaut i mean you

165

00:05:47,670 --> 00:05:45,440

require you know

166

00:05:49,350 --> 00:05:47,680

constantly pushing the boundaries

167

00:05:52,310 --> 00:05:49,360

and what do you you know what is the

168

00:05:54,710 --> 00:05:52,320

most physically demanding task both kind

169

00:05:56,710 --> 00:05:54,720

of before and and

170

00:05:59,029 --> 00:05:56,720

after like during you know during the

171

00:06:00,790 --> 00:05:59,039

spaceflight

172

00:06:02,629 --> 00:06:00,800

yeah great question you know and i think

173

00:06:04,469 --> 00:06:02,639

it's interesting to think about this it

174

00:06:06,950 --> 00:06:04,479

depends on the time horizon you're

175

00:06:09,270 --> 00:06:06,960

looking at so in the moment the short

176
00:06:11,510 --> 00:06:09,280
term short duration most challenging

177
00:06:15,029 --> 00:06:11,520
part of what we do i think is training

178
00:06:18,230 --> 00:06:15,039
for and executing spacewalks it's six to

179
00:06:20,390 --> 00:06:18,240
seven hours of uh of working and doing

180
00:06:22,070 --> 00:06:20,400
this these very important things on the

181
00:06:24,550 --> 00:06:22,080
outside of the space station in the

182
00:06:26,550 --> 00:06:24,560
extreme environment of of you know the

183
00:06:29,189 --> 00:06:26,560
vacuum of space high temperatures low

184
00:06:31,029 --> 00:06:29,199
temperatures no air and so that life

185
00:06:32,150 --> 00:06:31,039
support is critical but it's also very

186
00:06:33,830 --> 00:06:32,160
physically demanding you're moving

187
00:06:35,830 --> 00:06:33,840
around a suit that can weigh with your

188
00:06:37,749 --> 00:06:35,840

body and as much as a thousand pounds

189

00:06:39,749 --> 00:06:37,759

and you very rarely use your legs it's

190

00:06:41,830 --> 00:06:39,759

like running two marathons but on your

191

00:06:43,830 --> 00:06:41,840

hands the whole time your hands and

192

00:06:46,390 --> 00:06:43,840

fingers are very sore when you're done

193

00:06:47,510 --> 00:06:46,400

with this um and so that's the most

194

00:06:48,790 --> 00:06:47,520

physically challenging thing and

195

00:06:50,550 --> 00:06:48,800

training forward on the ground you're

196

00:06:52,629 --> 00:06:50,560

still in an extreme environment in the

197

00:06:55,990 --> 00:06:52,639

neutral buoyancy lab our 2 million

198

00:06:58,309 --> 00:06:56,000

gallon you know 40 foot deep pool

199

00:06:59,830 --> 00:06:58,319

where we train for space walks and so

200

00:07:02,070 --> 00:06:59,840

it's still it's still also physically

201
00:07:03,830 --> 00:07:02,080
demanding even underwater but when you

202
00:07:05,749 --> 00:07:03,840
when i think about the duration of a

203
00:07:08,469 --> 00:07:05,759
career and maybe something that has a

204
00:07:10,070 --> 00:07:08,479
huge impact on your lifespan i think all

205
00:07:12,390 --> 00:07:10,080
the traveling and training and the

206
00:07:14,950 --> 00:07:12,400
stresses of this job if you don't have

207
00:07:16,790 --> 00:07:14,960
healthy ways to manage that stress it

208
00:07:19,350 --> 00:07:16,800
can actually affect your sleep and then

209
00:07:21,430 --> 00:07:19,360
we we also have to become comfortable

210
00:07:23,270 --> 00:07:21,440
sleeping in space which is an extreme

211
00:07:24,390 --> 00:07:23,280
environment we do lots of outdoor

212
00:07:27,029 --> 00:07:24,400
training and you have to be able to

213
00:07:29,029 --> 00:07:27,039

sleep outdoors as well so i think just

214

00:07:30,790 --> 00:07:29,039

looking at the way that these things all

215

00:07:32,469 --> 00:07:30,800

of these stresses manifest in your life

216

00:07:34,550 --> 00:07:32,479

you also have to have healthy coping

217

00:07:36,309 --> 00:07:34,560

strategies for the travel all the

218

00:07:37,749 --> 00:07:36,319

different time zones we go in and all

219

00:07:38,710 --> 00:07:37,759

the different stressors that come with

220

00:07:40,710 --> 00:07:38,720

the work

221

00:07:42,710 --> 00:07:40,720

and then obviously then getting to space

222

00:07:44,869 --> 00:07:42,720

and being able to fall asleep and get

223

00:07:47,029 --> 00:07:44,879

the the important rest uh that you need

224

00:07:49,029 --> 00:07:47,039

to to accomplish your work day that's

225

00:07:51,110 --> 00:07:49,039

one i think is a is a very physically

226

00:07:52,710 --> 00:07:51,120

demanding aspect of of training and

227

00:07:55,029 --> 00:07:52,720

living in space

228

00:07:55,830 --> 00:07:55,039

okay victor there's two two things

229

00:07:56,869 --> 00:07:55,840

one

230

00:08:00,469 --> 00:07:56,879

i i

231

00:08:03,510 --> 00:08:00,479

fortunate enough to actually

232

00:08:05,589 --> 00:08:03,520

be fitted for suit uh years ago and just

233

00:08:07,510 --> 00:08:05,599

feeling the weight on earth versus i

234

00:08:09,270 --> 00:08:07,520

guess in zero g but what people i don't

235

00:08:11,110 --> 00:08:09,280

think understand also is what i

236

00:08:13,670 --> 00:08:11,120

understand you know this is

237

00:08:16,070 --> 00:08:13,680

how hard it is opening and closing your

238

00:08:18,150 --> 00:08:16,080

hand let alone like talk to talk about

239

00:08:19,749 --> 00:08:18,160

moving the arms and moving the hands the

240

00:08:21,670 --> 00:08:19,759

stiffness of the suit

241

00:08:24,230 --> 00:08:21,680

uh because of the the pressure

242

00:08:26,150 --> 00:08:24,240

differential just moving your hands the

243

00:08:27,350 --> 00:08:26,160

dexterity of that could you could you

244

00:08:29,189 --> 00:08:27,360

and then the next thing i want to ask

245

00:08:31,110 --> 00:08:29,199

you about is sleep but could you tell us

246

00:08:33,190 --> 00:08:31,120

a little bit about that

247

00:08:35,430 --> 00:08:33,200

so yes in that spacesuit right you're in

248

00:08:37,909 --> 00:08:35,440

the vacuum of space the pressure there

249

00:08:40,149 --> 00:08:37,919

is zero absolute zero so you need

250

00:08:42,389 --> 00:08:40,159

something to keep your fluids uh in your

251
00:08:43,509 --> 00:08:42,399
blood and and to help you stay conscious

252
00:08:45,670 --> 00:08:43,519
and comfortable it keeps your

253
00:08:47,829 --> 00:08:45,680
temperature uh in a comfortable range as

254
00:08:50,550 --> 00:08:47,839
well and so the suit is pressurized to

255
00:08:54,470 --> 00:08:50,560
four 4.2 pressure uh

256
00:08:57,190 --> 00:08:54,480
pounds per square inch 4.2 psi and so

257
00:08:59,269 --> 00:08:57,200
the entire suit is at 4.2 psi and it

258
00:09:02,070 --> 00:08:59,279
wants to sit about like this and so

259
00:09:04,870 --> 00:09:02,080
anytime you move you're moving against

260
00:09:06,870 --> 00:09:04,880
four pounds per square inch and so we

261
00:09:09,190 --> 00:09:06,880
have certain bearings if you rotate your

262
00:09:10,230 --> 00:09:09,200
arm like this you're rotating a bearing

263
00:09:11,750 --> 00:09:10,240

so that's

264

00:09:13,509 --> 00:09:11,760

roughly you just have to overcome a

265

00:09:15,910 --> 00:09:13,519

little friction but if you move like

266

00:09:18,310 --> 00:09:15,920

this you're pushing against the the suit

267

00:09:20,230 --> 00:09:18,320

the stiff fabric the many layers that

268

00:09:22,550 --> 00:09:20,240

can maintain that pressure in the vacuum

269

00:09:24,070 --> 00:09:22,560

of space and so when you close your hand

270

00:09:25,590 --> 00:09:24,080

a great example

271

00:09:27,750 --> 00:09:25,600

sometimes you'll hear people say it's

272

00:09:29,430 --> 00:09:27,760

like squeezing a tennis ball but but

273

00:09:31,430 --> 00:09:29,440

squeezing a tennis ball if you squeeze

274

00:09:34,070 --> 00:09:31,440

it it's work to squeeze it but then to

275

00:09:36,389 --> 00:09:34,080

let it go it you know opening it

276

00:09:38,870 --> 00:09:36,399

it pushes against you uh and helps you

277

00:09:40,949 --> 00:09:38,880

out what i like to say is moving around

278

00:09:43,590 --> 00:09:40,959

in the suit is like putting your hand in

279

00:09:45,829 --> 00:09:43,600

rice if you open your hand very wide

280

00:09:47,829 --> 00:09:45,839

you're pushing against that rice if you

281

00:09:49,030 --> 00:09:47,839

close your hand you're closing it

282

00:09:50,790 --> 00:09:49,040

against that rice and there are some

283

00:09:52,470 --> 00:09:50,800

athletes that use buckets of rice to

284

00:09:54,150 --> 00:09:52,480

train their grip strength and i think

285

00:09:55,829 --> 00:09:54,160

that's a little bit more of an accurate

286

00:09:57,110 --> 00:09:55,839

comparison

287

00:09:59,269 --> 00:09:57,120

did you do

288

00:10:01,509 --> 00:09:59,279

things like that to increase your grip

289

00:10:02,790 --> 00:10:01,519

strength because even dropping your arms

290

00:10:05,110 --> 00:10:02,800

you talk about pushing it up but

291

00:10:06,949 --> 00:10:05,120

dropping your arms and moving in in that

292

00:10:08,389 --> 00:10:06,959

way i mean what did you do anything

293

00:10:11,110 --> 00:10:08,399

physically to

294

00:10:13,750 --> 00:10:11,120

increase your strength with that

295

00:10:15,110 --> 00:10:13,760

absolutely we we have a great team of we

296

00:10:16,630 --> 00:10:15,120

call them astronaut strength

297

00:10:19,509 --> 00:10:16,640

conditioning and rehabilitation

298

00:10:22,310 --> 00:10:19,519

specialist acers for short and our acers

299

00:10:24,310 --> 00:10:22,320

craft very specific workouts to help us

300

00:10:26,470 --> 00:10:24,320

like i said training for spacewalks is

301

00:10:28,389 --> 00:10:26,480

also physically rigorous and so they

302

00:10:30,389 --> 00:10:28,399

actually develop those workouts to help

303

00:10:32,710 --> 00:10:30,399

us be safe in the neutral buoyancy lab

304

00:10:34,870 --> 00:10:32,720

where we train and obviously to to also

305

00:10:37,590 --> 00:10:34,880

help benefit while we're in space and we

306

00:10:39,590 --> 00:10:37,600

do very specific exercises for our grip

307

00:10:41,509 --> 00:10:39,600

as well as for our shoulders those are

308

00:10:43,590 --> 00:10:41,519

two of the areas that that you really

309

00:10:46,470 --> 00:10:43,600

tax when you're doing spacewalk training

310

00:10:47,750 --> 00:10:46,480

or an actual walk-in space and so and

311

00:10:49,509 --> 00:10:47,760

the other thing is they give us

312

00:10:52,069 --> 00:10:49,519

suggestions on how to work out for

313

00:10:54,150 --> 00:10:52,079

example when i do my shoulder exercises

314

00:10:56,550 --> 00:10:54,160

i originally started using dumbbells and

315

00:10:59,110 --> 00:10:56,560

i would hold the handle and and do my

316

00:11:01,030 --> 00:10:59,120

shoulder exercising rotating and you

317

00:11:03,110 --> 00:11:01,040

know doing things to exercise my rotator

318

00:11:05,509 --> 00:11:03,120

cuff and all those small muscles around

319

00:11:07,829 --> 00:11:05,519

your shoulders uh what i started doing

320

00:11:10,949 --> 00:11:07,839

because of the suggestion of my strength

321

00:11:12,870 --> 00:11:10,959

trainer specialist was to use plates the

322

00:11:15,430 --> 00:11:12,880

same weight but in a plate and i would

323

00:11:17,829 --> 00:11:15,440

pinch them so that during my exercise i

324

00:11:19,670 --> 00:11:17,839

was also increasing the challenge on my

325

00:11:21,750 --> 00:11:19,680

grip and therefore getting a better grip

326

00:11:23,750 --> 00:11:21,760

workout while i was exercising my

327

00:11:25,590 --> 00:11:23,760

shoulders things like that are the kinds

328

00:11:27,269 --> 00:11:25,600

of things that our astronaut strength

329

00:11:29,350 --> 00:11:27,279

conditioning rehabilitation specialists

330

00:11:31,829 --> 00:11:29,360

help us with

331

00:11:33,990 --> 00:11:31,839

did you feel that's incredible did you

332

00:11:35,829 --> 00:11:34,000

feel the longer you're up there because

333

00:11:37,910 --> 00:11:35,839

i want to just just a little question on

334

00:11:39,030 --> 00:11:37,920

this also is that you're there for so

335

00:11:40,550 --> 00:11:39,040

long and

336

00:11:43,030 --> 00:11:40,560

the time when you got there when you did

337

00:11:45,910 --> 00:11:43,040

the space walk was there

338

00:11:49,030 --> 00:11:45,920

do you is there what level of

339

00:11:51,910 --> 00:11:49,040

depreciation of bone and muscle

340

00:11:53,750 --> 00:11:51,920

uh density is there and did you feel a

341

00:11:55,430 --> 00:11:53,760

difference like is there

342

00:11:57,670 --> 00:11:55,440

what happens to your metabolism with the

343

00:11:59,269 --> 00:11:57,680

krebs cycle with the mitochondria did

344

00:12:00,550 --> 00:11:59,279

that affect the space walk could you

345

00:12:02,389 --> 00:12:00,560

tell the difference in terms of your

346

00:12:04,069 --> 00:12:02,399

strength on the ground that you built up

347

00:12:07,509 --> 00:12:04,079

is there a diminishing

348

00:12:09,269 --> 00:12:07,519

longer that you're in space is my

349

00:12:11,670 --> 00:12:09,279

question ultimately and how did that

350

00:12:14,230 --> 00:12:11,680

affect your metabolism your bmr you know

351

00:12:16,629 --> 00:12:14,240

with with calories and nutrition

352

00:12:18,230 --> 00:12:16,639

did you have to think about it oh wow

353

00:12:20,069 --> 00:12:18,240

yeah there's a lot packed in there and

354

00:12:21,670 --> 00:12:20,079

so i'll you know that uh that is

355

00:12:23,670 --> 00:12:21,680

definitely something we work hard to

356

00:12:24,470 --> 00:12:23,680

mitigate you're going to lose bone and

357

00:12:29,590 --> 00:12:24,480

muscle

358

00:12:31,110 --> 00:12:29,600

atrophy from just you don't i weigh 200

359

00:12:33,190 --> 00:12:31,120

pounds and i'm not carrying that 200

360

00:12:34,710 --> 00:12:33,200

pounds it's like taking off a 200 pound

361

00:12:37,590 --> 00:12:34,720

backpack when i get to weightlessness

362

00:12:39,750 --> 00:12:37,600

and so i'm losing that uh that that

363

00:12:41,990 --> 00:12:39,760

effort every day and so i have to make

364

00:12:43,829 --> 00:12:42,000

it up in my workout uh and also your

365

00:12:45,430 --> 00:12:43,839

bone density we have this condition

366

00:12:48,389 --> 00:12:45,440

called osteopenia it's like

367

00:12:50,470 --> 00:12:48,399

space-induced osteoporosis uh the the

368

00:12:52,470 --> 00:12:50,480

the enzymes that encourage bone growth

369

00:12:54,710 --> 00:12:52,480

you know our bones are constantly being

370

00:12:56,550 --> 00:12:54,720

uh reclaimed or eaten and then

371

00:12:59,030 --> 00:12:56,560

re-constituted

372

00:13:01,670 --> 00:12:59,040

and in space for some reason the process

373

00:13:04,150 --> 00:13:01,680

that eats the bone or takes away bones

374

00:13:06,790 --> 00:13:04,160

continues but the part that reforms new

375

00:13:08,870 --> 00:13:06,800

bone slows down and so we try to

376

00:13:10,629 --> 00:13:08,880

mitigate that with our strength training

377

00:13:12,870 --> 00:13:10,639

and also with uh

378

00:13:15,910 --> 00:13:12,880

medication and so

379

00:13:18,069 --> 00:13:15,920

the the effects there uh can be it can

380

00:13:19,990 --> 00:13:18,079

have a huge effect on you but

381

00:13:22,230 --> 00:13:20,000

the workouts that we do are one of the

382

00:13:23,829 --> 00:13:22,240

biggest mitigators and so i actually

383

00:13:25,670 --> 00:13:23,839

started working out before the long

384

00:13:28,310 --> 00:13:25,680

before the mission and then when i got

385

00:13:30,629 --> 00:13:28,320

into space i continue to work out we get

386

00:13:32,470 --> 00:13:30,639

two and a half hours every day to do

387

00:13:34,389 --> 00:13:32,480

exercise strength training uh

388

00:13:35,829 --> 00:13:34,399

cardiovascular training and then also

389

00:13:38,949 --> 00:13:35,839

time to clean up and get ready for the

390

00:13:40,949 --> 00:13:38,959

work day and that was extremely valuable

391

00:13:42,550 --> 00:13:40,959

now when i first got to space my body is

392

00:13:44,470 --> 00:13:42,560

going through so many changes i lost

393

00:13:46,949 --> 00:13:44,480

about two kilograms and i was only

394

00:13:49,509 --> 00:13:46,959

eating about 2200 calories it took me

395

00:13:52,069 --> 00:13:49,519

about 45 days to get used to the the

396

00:13:53,990 --> 00:13:52,079

environment to to to come up with some

397

00:13:55,590 --> 00:13:54,000

you know strategies for me to eat like i

398

00:13:57,670 --> 00:13:55,600

did on the ground like keeping snacks in

399

00:13:59,670 --> 00:13:57,680

my pocket at all time and when i started

400

00:14:02,389 --> 00:13:59,680

snacking and eating in space more like i

401
00:14:05,110 --> 00:14:02,399
did on the ground i got up to 3 300 or

402
00:14:06,870 --> 00:14:05,120
so calories 3 200 calories a day and i

403
00:14:09,590 --> 00:14:06,880
was also working out very hard so

404
00:14:11,910 --> 00:14:09,600
overall in space i actually felt

405
00:14:13,990 --> 00:14:11,920
stronger than i did on the ground i was

406
00:14:16,230 --> 00:14:14,000
able to work out really hard in fact i

407
00:14:17,829 --> 00:14:16,240
told myself before flight i wanted to

408
00:14:20,230 --> 00:14:17,839
make sure i didn't get hurt i didn't

409
00:14:21,910 --> 00:14:20,240
want to hurt my back or my shoulders

410
00:14:23,590 --> 00:14:21,920
because i wanted to always be ready for

411
00:14:25,670 --> 00:14:23,600
the spacewalks and all of the other work

412
00:14:27,750 --> 00:14:25,680
on the space station and so i felt like

413
00:14:29,350 --> 00:14:27,760

i could have lifted even heavier and ran

414

00:14:31,269 --> 00:14:29,360

harder on the treadmill but i just

415

00:14:32,710 --> 00:14:31,279

didn't want to hurt myself but the the

416

00:14:35,829 --> 00:14:32,720

strength training and cardio training

417

00:14:37,509 --> 00:14:35,839

are excellent in space

418

00:14:39,030 --> 00:14:37,519

incredible so that it when you were

419

00:14:40,230 --> 00:14:39,040

doing your spacewalks you didn't feel

420

00:14:42,470 --> 00:14:40,240

like you had

421

00:14:44,310 --> 00:14:42,480

lost strength

422

00:14:47,110 --> 00:14:44,320

not at all by the time we went out the

423

00:14:48,710 --> 00:14:47,120

door i felt stronger actually and over

424

00:14:51,430 --> 00:14:48,720

my mission i did lose a little bit of

425

00:14:53,030 --> 00:14:51,440

bone mass i lost about two percent of my

426

00:14:55,590 --> 00:14:53,040

bone mass and they say i'll have that

427

00:14:57,269 --> 00:14:55,600

recovered in about a year muscle mass i

428

00:14:59,430 --> 00:14:57,279

actually gained so i told you i lost two

429

00:15:00,870 --> 00:14:59,440

kilograms in the first two months at the

430

00:15:03,269 --> 00:15:00,880

end of the mission though after the

431

00:15:05,509 --> 00:15:03,279

complete six months i was four kilograms

432

00:15:07,430 --> 00:15:05,519

heavier so i gained back that two and

433

00:15:08,949 --> 00:15:07,440

then put four more on so i came back

434

00:15:09,670 --> 00:15:08,959

with more muscle mass than i launched

435

00:15:11,030 --> 00:15:09,680

with

436

00:15:13,030 --> 00:15:11,040

that's incredible

437

00:15:16,230 --> 00:15:13,040

and so you feel like did that had a had

438

00:15:19,269 --> 00:15:16,240

a reflection on your metabolism overall

439

00:15:21,110 --> 00:15:19,279

increase your metabolism so i i think

440

00:15:23,189 --> 00:15:21,120

if i i think it may have been an

441

00:15:26,389 --> 00:15:23,199

increase i took a test when i got back

442

00:15:28,230 --> 00:15:26,399

to to check our vo2 max and so the vo2

443

00:15:31,430 --> 00:15:28,240

max is is a great example of how we're

444

00:15:33,350 --> 00:15:31,440

doing metabolically uh and so i i was in

445

00:15:35,910 --> 00:15:33,360

family i was close to when i launched

446

00:15:38,150 --> 00:15:35,920

and that's what our our acers also are

447

00:15:39,829 --> 00:15:38,160

focused on helping us reacclimate to

448

00:15:41,749 --> 00:15:39,839

earth and getting us back to what we

449

00:15:44,949 --> 00:15:41,759

were like pre-flight and so my strength

450

00:15:47,189 --> 00:15:44,959

numbers my bench press squat my vo2 max

451
00:15:49,990 --> 00:15:47,199
we do that by getting on a cycle and

452
00:15:52,790 --> 00:15:50,000
going until we until we fail us pretty

453
00:15:54,870 --> 00:15:52,800
much and they measure our gases that

454
00:15:57,110 --> 00:15:54,880
we're inspiring and expiring and and

455
00:15:59,110 --> 00:15:57,120
that tells them our vo2 max and my

456
00:16:01,350 --> 00:15:59,120
number was a point or two different than

457
00:16:02,470 --> 00:16:01,360
what i was pre-flight and so i would say

458
00:16:05,030 --> 00:16:02,480
overall

459
00:16:06,949 --> 00:16:05,040
i was able to maintain my metabolism and

460
00:16:08,069 --> 00:16:06,959
that's pretty impressive considering all

461
00:16:09,910 --> 00:16:08,079
of the things that your body is

462
00:16:11,990 --> 00:16:09,920
experiencing that isn't that is

463
00:16:13,910 --> 00:16:12,000

impressive did they test your bmr after

464

00:16:15,509 --> 00:16:13,920

the flight to understand what that was

465

00:16:17,509 --> 00:16:15,519

did that change at all

466

00:16:19,670 --> 00:16:17,519

that number uh

467

00:16:21,030 --> 00:16:19,680

i don't we don't normally do that for

468

00:16:22,949 --> 00:16:21,040

for crew members i think that's

469

00:16:25,030 --> 00:16:22,959

something you can get if you want to but

470

00:16:27,189 --> 00:16:25,040

i was involved in an experiment called

471

00:16:29,030 --> 00:16:27,199

maya tones which is studying not just

472

00:16:30,949 --> 00:16:29,040

muscle mass but the quality of your

473

00:16:32,949 --> 00:16:30,959

muscle and it's really looking at this

474

00:16:34,790 --> 00:16:32,959

device to see if we can use a very

475

00:16:36,389 --> 00:16:34,800

simple external device without having to

476

00:16:39,030 --> 00:16:36,399

do like biopsies

477

00:16:40,230 --> 00:16:39,040

to determine muscle tissue quality and

478

00:16:41,990 --> 00:16:40,240

so that

479

00:16:43,910 --> 00:16:42,000

experiment actually takes 10

480

00:16:45,829 --> 00:16:43,920

measurements all around your body over

481

00:16:47,670 --> 00:16:45,839

the course of the mission and you also

482

00:16:49,670 --> 00:16:47,680

have pre-flight and post-flight numbers

483

00:16:51,829 --> 00:16:49,680

to compare it to and so i actually was

484

00:16:52,710 --> 00:16:51,839

able to get those kinds of measurements

485

00:16:54,629 --> 00:16:52,720

uh

486

00:16:55,670 --> 00:16:54,639

like i said before flight in flight and

487

00:16:56,949 --> 00:16:55,680

after

488

00:16:58,310 --> 00:16:56,959

yeah because you were there for six

489

00:16:59,509 --> 00:16:58,320

months what was the difference because

490

00:17:01,430 --> 00:16:59,519

when we talked about going to the moon

491

00:17:03,509 --> 00:17:01,440

we talked about going to mars

492

00:17:07,510 --> 00:17:03,519

was there was there a large difference

493

00:17:11,189 --> 00:17:07,520

as time went on with those numbers

494

00:17:13,110 --> 00:17:11,199

uh it actually i i i lost a little bit

495

00:17:15,429 --> 00:17:13,120

in the beginning and gained muscle over

496

00:17:17,429 --> 00:17:15,439

time and so i think my overall

497

00:17:19,669 --> 00:17:17,439

proportion stayed the same and being

498

00:17:21,429 --> 00:17:19,679

able to maintain what you start with on

499

00:17:24,870 --> 00:17:21,439

earth is is great that's a great

500

00:17:26,789 --> 00:17:24,880

standard uh and but that's very much

501
00:17:28,470 --> 00:17:26,799
because of the amazing exercise

502
00:17:30,390 --> 00:17:28,480
equipment and if you've never seen it

503
00:17:32,549 --> 00:17:30,400
the the a red it's the advanced

504
00:17:34,390 --> 00:17:32,559
resistive exercise device one of the

505
00:17:37,350 --> 00:17:34,400
most important technologies on the space

506
00:17:38,310 --> 00:17:37,360
station in my opinion it allows us to do

507
00:17:40,310 --> 00:17:38,320
uh

508
00:17:42,630 --> 00:17:40,320
all kinds of exercises bench press

509
00:17:45,110 --> 00:17:42,640
squats curls and that machine though

510
00:17:47,190 --> 00:17:45,120
takes up almost half a module

511
00:17:48,870 --> 00:17:47,200
the space for the machine plus the range

512
00:17:51,270 --> 00:17:48,880
of motion for the body that you put on

513
00:17:53,270 --> 00:17:51,280

it and so when we go to the moon we

514

00:17:54,789 --> 00:17:53,280

won't be able to do that kind of workout

515

00:17:56,150 --> 00:17:54,799

in transit and that's very important to

516

00:17:57,990 --> 00:17:56,160

understand we're going to have something

517

00:18:00,230 --> 00:17:58,000

smaller like a rower like an erg that

518

00:18:02,070 --> 00:18:00,240

you would see on earth but when we get

519

00:18:03,669 --> 00:18:02,080

to the moon or to lunar orbit we're

520

00:18:06,070 --> 00:18:03,679

going to need some type of a habitation

521

00:18:08,470 --> 00:18:06,080

module where we can get exercise because

522

00:18:11,270 --> 00:18:08,480

that that bone and muscle health

523

00:18:13,350 --> 00:18:11,280

and also it was a part of the of what i

524

00:18:14,870 --> 00:18:13,360

enjoyed most during the day so it's also

525

00:18:16,070 --> 00:18:14,880

a part of mental well-being but it's

526

00:18:17,830 --> 00:18:16,080

very important to our physical

527

00:18:19,830 --> 00:18:17,840

well-being

528

00:18:21,590 --> 00:18:19,840

right so you feel like when we go to

529

00:18:23,270 --> 00:18:21,600

mars obviously on the planet there'll be

530

00:18:24,150 --> 00:18:23,280

a whole module for it but on the way to

531

00:18:26,070 --> 00:18:24,160

mars

532

00:18:27,590 --> 00:18:26,080

is there's you'll feel like we'll need a

533

00:18:30,070 --> 00:18:27,600

separate thing i mean because you know

534

00:18:32,310 --> 00:18:30,080

when you see 2001 we're talking about do

535

00:18:34,549 --> 00:18:32,320

we do we put a you know a force of

536

00:18:36,950 --> 00:18:34,559

gravity when you talk about what the the

537

00:18:39,029 --> 00:18:36,960

difference of of gravity on mars versus

538

00:18:40,070 --> 00:18:39,039

the moon and on the way there i know

539

00:18:43,669 --> 00:18:40,080

there's been a lot of talk and

540

00:18:45,510 --> 00:18:43,679

evaluation as to what is you know 0.6 uh

541

00:18:47,350 --> 00:18:45,520

gravity on the human body you know we're

542

00:18:49,110 --> 00:18:47,360

all we don't really know until we get

543

00:18:50,950 --> 00:18:49,120

there and it's it's done for an extended

544

00:18:53,270 --> 00:18:50,960

period of time so

545

00:18:55,270 --> 00:18:53,280

you feel like will we have a separate

546

00:18:57,590 --> 00:18:55,280

module just on the way to mars that

547

00:18:59,029 --> 00:18:57,600

that's what it'll have

548

00:19:00,950 --> 00:18:59,039

i think so because with current

549

00:19:02,870 --> 00:19:00,960

propulsion technology right we need to

550

00:19:04,470 --> 00:19:02,880

get better propulsion technology because

551

00:19:06,150 --> 00:19:04,480

if we can shorten the duration of the

552

00:19:08,549 --> 00:19:06,160

trip right now it's going to be six to

553

00:19:10,630 --> 00:19:08,559

nine months if we can shorten that trip

554

00:19:12,630 --> 00:19:10,640

that means less radiation exposure and

555

00:19:14,470 --> 00:19:12,640

less time for your body to degrade in

556

00:19:16,310 --> 00:19:14,480

weightlessness but you know trying to

557

00:19:18,390 --> 00:19:16,320

create artificial gravity by spinning

558

00:19:20,549 --> 00:19:18,400

one module that creates guidance and

559

00:19:22,549 --> 00:19:20,559

navigation and control challenges due to

560

00:19:23,830 --> 00:19:22,559

gyroscopic effects so it would actually

561

00:19:25,750 --> 00:19:23,840

be a little it would be really

562

00:19:27,110 --> 00:19:25,760

complicated to do that so you're going

563

00:19:29,110 --> 00:19:27,120

to need to exercise you're going to need

564

00:19:30,630 --> 00:19:29,120

basic exercise and something i try to

565

00:19:32,310 --> 00:19:30,640

encourage our scientists and our

566

00:19:33,110 --> 00:19:32,320

exercise specialists to think to think

567

00:19:35,510 --> 00:19:33,120

about

568

00:19:37,590 --> 00:19:35,520

is you know a red is a fantastic machine

569

00:19:39,830 --> 00:19:37,600

a wonderful contraption but we also need

570

00:19:41,669 --> 00:19:39,840

to remember basic things i wrestled in

571

00:19:43,909 --> 00:19:41,679

college and in high school and so i

572

00:19:46,789 --> 00:19:43,919

think of the most amazing exercise

573

00:19:49,110 --> 00:19:46,799

device there is in history is another

574

00:19:51,110 --> 00:19:49,120

human body that's my opinion but you

575

00:19:53,190 --> 00:19:51,120

know also doing calisthenics or just

576

00:19:55,430 --> 00:19:53,200

basic isometrics where you push on a

577

00:19:57,350 --> 00:19:55,440

structure and so maybe just getting in

578

00:19:59,350 --> 00:19:57,360

the corner of a module and putting your

579

00:20:01,669 --> 00:19:59,360

hands and feet against different sides

580

00:20:03,669 --> 00:20:01,679

and pushing statically against something

581

00:20:05,669 --> 00:20:03,679

or using another crewmate and you both

582

00:20:07,669 --> 00:20:05,679

kind of do squat presses where you're

583

00:20:09,590 --> 00:20:07,679

pushing against each other those are the

584

00:20:11,909 --> 00:20:09,600

kinds of things we need to think about

585

00:20:13,510 --> 00:20:11,919

and find ways to incorporate so that we

586

00:20:16,149 --> 00:20:13,520

not only have the ability to do strength

587

00:20:17,830 --> 00:20:16,159

training but we also have a a backup in

588

00:20:19,430 --> 00:20:17,840

case a machine breaks because again on

589

00:20:21,270 --> 00:20:19,440

the way to mars you're not going to be

590

00:20:23,510 --> 00:20:21,280

able to stop off at the hardware store

591

00:20:25,510 --> 00:20:23,520

and and get parts to fix it and so we

592

00:20:27,270 --> 00:20:25,520

need to have a way to back up uh those

593

00:20:29,909 --> 00:20:27,280

exercise devices because it's such a

594

00:20:31,350 --> 00:20:29,919

vital a part of physical and mental

595

00:20:33,110 --> 00:20:31,360

well-being

596

00:20:34,789 --> 00:20:33,120

that's a very good point that is a very

597

00:20:36,149 --> 00:20:34,799

good point you know it's interesting

598

00:20:38,230 --> 00:20:36,159

because

599

00:20:40,310 --> 00:20:38,240

we know what zero g is

600

00:20:42,789 --> 00:20:40,320

you know have a great idea i think of

601
00:20:45,669 --> 00:20:42,799
what what the how the body behaves under

602
00:20:47,510 --> 00:20:45,679
zero g over extended period of time and

603
00:20:49,830 --> 00:20:47,520
of course on earth but all those

604
00:20:52,070 --> 00:20:49,840
experiments in terms of the moon and and

605
00:20:54,310 --> 00:20:52,080
on our way when we get to mars how's the

606
00:20:56,230 --> 00:20:54,320
body at point six at that you know those

607
00:20:58,149 --> 00:20:56,240
different forces of gravity how will the

608
00:21:00,070 --> 00:20:58,159
body develop are these things that that

609
00:21:01,909 --> 00:21:00,080
you guys spoke of and as you were

610
00:21:04,630 --> 00:21:01,919
preparing for this flight did you

611
00:21:07,430 --> 00:21:04,640
evaluate any of that

612
00:21:08,950 --> 00:21:07,440
uh no we didn't but uh i do know that

613
00:21:11,350 --> 00:21:08,960

people are thinking about that the

614

00:21:13,190 --> 00:21:11,360

scientific and the medical communities i

615

00:21:14,710 --> 00:21:13,200

know that at the crew that just returned

616

00:21:15,830 --> 00:21:14,720

so we just launched the crew to space

617

00:21:18,390 --> 00:21:15,840

that you were you were there for that

618

00:21:20,470 --> 00:21:18,400

launch well uh just prior to that we we

619

00:21:22,390 --> 00:21:20,480

returned crew two the crew that flew to

620

00:21:24,630 --> 00:21:22,400

space station after us in a dragon and

621

00:21:26,789 --> 00:21:24,640

when they got back they actually had an

622

00:21:28,470 --> 00:21:26,799

activity just after launch just i'm

623

00:21:30,230 --> 00:21:28,480

sorry just after landing just within

624

00:21:31,830 --> 00:21:30,240

hours after they landed we had

625

00:21:34,070 --> 00:21:31,840

activities where they had to climb up a

626
00:21:36,549 --> 00:21:34,080
contraption and move some some large

627
00:21:38,390 --> 00:21:36,559
masses that simulates being able to

628
00:21:40,149 --> 00:21:38,400
throw out the emergency equipment into

629
00:21:43,029 --> 00:21:40,159
the water if you landed in the water in

630
00:21:44,710 --> 00:21:43,039
your capsule after being deconditioned

631
00:21:47,350 --> 00:21:44,720
from being in space for an extended

632
00:21:49,430 --> 00:21:47,360
period the moon missions are apollo

633
00:21:51,510 --> 00:21:49,440
astronauts they say that the the worst

634
00:21:54,070 --> 00:21:51,520
period of deconditioning was after a 14

635
00:21:56,070 --> 00:21:54,080
to 21 day mission in space somewhere in

636
00:21:58,390 --> 00:21:56,080
that third week of being in space and

637
00:22:00,230 --> 00:21:58,400
that's uh what what our moon missions

638
00:22:02,310 --> 00:22:00,240

will be like and so coming back deep

639

00:22:04,149 --> 00:22:02,320

condition landing in the water and maybe

640

00:22:05,909 --> 00:22:04,159

landing off target we need to know that

641

00:22:07,830 --> 00:22:05,919

folks can can operate and function in

642

00:22:09,909 --> 00:22:07,840

that environment so we think about it

643

00:22:12,149 --> 00:22:09,919

but for missions to the station we're

644

00:22:13,909 --> 00:22:12,159

going to be in weightlessness for an

645

00:22:16,789 --> 00:22:13,919

extended period and then have to

646

00:22:19,830 --> 00:22:16,799

recondition to 1g and so our focus is on

647

00:22:22,789 --> 00:22:19,840

1g but i do think we need to find ways

648

00:22:24,390 --> 00:22:22,799

in that construct to to evaluate things

649

00:22:27,190 --> 00:22:24,400

like this you know coming back from the

650

00:22:28,789 --> 00:22:27,200

moon or being on mars because it's it's

651
00:22:30,070 --> 00:22:28,799
amazing i was just writing an email to

652
00:22:31,830 --> 00:22:30,080
the folks that just went up there to

653
00:22:33,830 --> 00:22:31,840
crew 3 and one of the things i

654
00:22:35,590 --> 00:22:33,840
encouraged them to do was to to learn

655
00:22:37,830 --> 00:22:35,600
the lessons that space is going to teach

656
00:22:39,990 --> 00:22:37,840
you i used the example of the apollo

657
00:22:42,149 --> 00:22:40,000
astronauts the hop they would do on the

658
00:22:43,909 --> 00:22:42,159
surface of the moon they they weren't

659
00:22:45,990 --> 00:22:43,919
taught that they innovated they figured

660
00:22:47,990 --> 00:22:46,000
it out because the environment it made

661
00:22:50,310 --> 00:22:48,000
sense in that you know

662
00:22:52,470 --> 00:22:50,320
one-sixth of earth's gravity they

663
00:22:54,390 --> 00:22:52,480

realized it was easier to hop than to

664

00:22:56,549 --> 00:22:54,400

try to ambulate to try to walk like you

665

00:22:57,990 --> 00:22:56,559

do on earth and so sometimes you just

666

00:23:01,110 --> 00:22:58,000

need to be in that environment like you

667

00:23:03,190 --> 00:23:01,120

said you need to experience 0.6 g to

668

00:23:05,110 --> 00:23:03,200

understand how your body wants to

669

00:23:07,669 --> 00:23:05,120

operate and you know the physical sense

670

00:23:09,270 --> 00:23:07,679

there's a little genius to the body and

671

00:23:10,630 --> 00:23:09,280

we need to be good at listening to what

672

00:23:12,549 --> 00:23:10,640

our bodies tell us

673

00:23:13,990 --> 00:23:12,559

that's a good point that's incredible i

674

00:23:15,590 --> 00:23:14,000

know that hop i was always thinking you

675

00:23:17,510 --> 00:23:15,600

know you don't want to fall do you know

676

00:23:19,270 --> 00:23:17,520

what i mean because damn it can't damage

677

00:23:21,669 --> 00:23:19,280

that suit at all one thing i just want

678

00:23:23,669 --> 00:23:21,679

to ask like when you did your space walk

679

00:23:26,310 --> 00:23:23,679

what happens if you have an itch on your

680

00:23:27,830 --> 00:23:26,320

nose your ear

681

00:23:29,669 --> 00:23:27,840

you're thinking like you start sweating

682

00:23:31,350 --> 00:23:29,679

you're going oh my gosh you know

683

00:23:32,789 --> 00:23:31,360

one of these i mean what's

684

00:23:34,390 --> 00:23:32,799

you can't get your arm out to just

685

00:23:35,510 --> 00:23:34,400

scratch that did you ever have it you

686

00:23:36,870 --> 00:23:35,520

know

687

00:23:38,310 --> 00:23:36,880

somewhere you're like man i can't wait

688

00:23:40,549 --> 00:23:38,320

till this is over i've gotta i'm gonna

689

00:23:42,710 --> 00:23:40,559

have a good scratch here

690

00:23:44,149 --> 00:23:42,720

well yes i think as soon as you put the

691

00:23:45,669 --> 00:23:44,159

suit on and you know you're going to

692

00:23:47,430 --> 00:23:45,679

pressurize it that's when everything

693

00:23:49,510 --> 00:23:47,440

does start to feel you start oh is that

694

00:23:52,310 --> 00:23:49,520

an itch coming uh but so we actually

695

00:23:54,789 --> 00:23:52,320

have a device inside the suit that is

696

00:23:56,470 --> 00:23:54,799

for valsalva it's just like in airplanes

697

00:23:58,630 --> 00:23:56,480

as you start to descend and you feel the

698

00:24:00,630 --> 00:23:58,640

pressure build up in your ears we have a

699

00:24:02,549 --> 00:24:00,640

small foam block that we can push our

700

00:24:04,470 --> 00:24:02,559

nostrils against so that we can force

701

00:24:06,870 --> 00:24:04,480

air and and then expand

702

00:24:09,510 --> 00:24:06,880

air into our eardrums to valsalva but

703

00:24:11,590 --> 00:24:09,520

that device is used mostly i i think i

704

00:24:14,070 --> 00:24:11,600

can speak for the entire astronaut core

705

00:24:15,990 --> 00:24:14,080

to say its number one use is to rest

706

00:24:19,510 --> 00:24:16,000

your chin on so that you can rest and

707

00:24:21,830 --> 00:24:19,520

then number two is to scratch your face

708

00:24:23,669 --> 00:24:21,840

and so there there is a way to scratch

709

00:24:27,029 --> 00:24:23,679

certain itches depending on if it's in

710

00:24:30,630 --> 00:24:27,039

this area you can scratch it

711

00:24:33,110 --> 00:24:32,070

yeah would you take the suit off quote i

712

00:24:34,630 --> 00:24:33,120

didn't mean to cut you off i beg your

713

00:24:36,390 --> 00:24:34,640

pardon yeah you're you're definitely

714

00:24:38,149 --> 00:24:36,400

looking for some relief when you take it

715

00:24:40,310 --> 00:24:38,159

off there's all kind of little itches or

716

00:24:42,789 --> 00:24:40,320

aches and pains and and so you know

717

00:24:45,110 --> 00:24:42,799

interestingly i also had

718

00:24:47,350 --> 00:24:45,120

i had a situation that i almost couldn't

719

00:24:50,950 --> 00:24:47,360

do anything about so we have this

720

00:24:53,590 --> 00:24:50,960

anti-fog on the inside we dab just a few

721

00:24:55,990 --> 00:24:53,600

drops wipe it on the entire visor and

722

00:24:57,590 --> 00:24:56,000

try to get rid of it and uh i there have

723

00:24:59,990 --> 00:24:57,600

been other instances of astronauts

724

00:25:02,390 --> 00:25:00,000

experiencing that anti-fault getting in

725

00:25:04,230 --> 00:25:02,400

their eyes and i don't believe it was

726

00:25:05,750 --> 00:25:04,240

the anaphog i applied to the suit

727

00:25:07,110 --> 00:25:05,760

there's actually an investigation going

728

00:25:08,549 --> 00:25:07,120

on to find out where it may have come

729

00:25:10,710 --> 00:25:08,559

from maybe it was sucked up into the

730

00:25:13,510 --> 00:25:10,720

life support system and then pushed back

731

00:25:16,149 --> 00:25:13,520

out later but i had three spacewalks

732

00:25:17,750 --> 00:25:16,159

where i felt so i did four total and on

733

00:25:19,350 --> 00:25:17,760

three of those spacewalks i had

734

00:25:20,789 --> 00:25:19,360

something in my eye that caused a

735

00:25:22,789 --> 00:25:20,799

burning sensation

736

00:25:24,310 --> 00:25:22,799

and one of those happened while i was

737

00:25:26,230 --> 00:25:24,320

working on a pretty important piece of

738

00:25:28,470 --> 00:25:26,240

hardware and so i actually had to just

739

00:25:30,950 --> 00:25:28,480

stop and hold still and i just kept

740

00:25:33,110 --> 00:25:30,960

blinking waiting for my eye to water and

741

00:25:35,110 --> 00:25:33,120

it did and again my body took care of

742

00:25:37,909 --> 00:25:35,120

itself and so i just kept blinking and

743

00:25:40,390 --> 00:25:37,919

the my eye watering over time it

744

00:25:42,390 --> 00:25:40,400

dissolved whatever that was but it took

745

00:25:44,230 --> 00:25:42,400

time it wasn't just a small thing that

746

00:25:45,590 --> 00:25:44,240

the liquid pushed out it had to dissolve

747

00:25:48,310 --> 00:25:45,600

something and i could feel the burning

748

00:25:50,390 --> 00:25:48,320

sensation slowly decrease and then i was

749

00:25:52,310 --> 00:25:50,400

able to see and finish my activity but

750

00:25:55,190 --> 00:25:52,320

it felt like i was standing there out on

751
00:25:57,590 --> 00:25:55,200
the mast on the very end of the space

752
00:26:00,230 --> 00:25:57,600
station i was on the solar away solar

753
00:26:01,990 --> 00:26:00,240
array uh on a space on the space station

754
00:26:03,830 --> 00:26:02,000
and i was way out there waiting for this

755
00:26:05,990 --> 00:26:03,840
burning sensation to go away a pretty

756
00:26:08,230 --> 00:26:06,000
interesting experience

757
00:26:09,990 --> 00:26:08,240
i i think that's an understatement isn't

758
00:26:13,750 --> 00:26:10,000
it

759
00:26:15,190 --> 00:26:13,760
that's intense

760
00:26:16,950 --> 00:26:15,200
that is that is it

761
00:26:17,990 --> 00:26:16,960
congratulations it wasn't glad you made

762
00:26:24,390 --> 00:26:18,000
it true

763
00:26:29,269 --> 00:26:26,310

uh but there's other things in the suit

764

00:26:31,510 --> 00:26:29,279

you know we we wear a harness that can

765

00:26:33,350 --> 00:26:31,520

uh take biometric measurements it sees

766

00:26:35,590 --> 00:26:33,360

our heart rate and they can figure out

767

00:26:38,070 --> 00:26:35,600

respiration and understand how quickly

768

00:26:40,470 --> 00:26:38,080

we're going through our oxygen and co2

769

00:26:42,710 --> 00:26:40,480

scrubbing systems and so those uh we

770

00:26:44,870 --> 00:26:42,720

have those leads stuck to our body with

771

00:26:47,590 --> 00:26:44,880

with an adhesive but underneath that

772

00:26:48,630 --> 00:26:47,600

there is a uh they they call it the um

773

00:26:51,110 --> 00:26:48,640

the uh

774

00:26:52,789 --> 00:26:51,120

electrode gel and it's this gel that we

775

00:26:55,110 --> 00:26:52,799

put on before we stick them to our chest

776

00:26:56,630 --> 00:26:55,120

and cover them with tape well that gel

777

00:26:59,029 --> 00:26:56,640

could have potentially leaked out as

778

00:27:00,789 --> 00:26:59,039

well and i've never put it in my eye to

779

00:27:02,710 --> 00:27:00,799

see what it feels like but i imagine it

780

00:27:04,549 --> 00:27:02,720

wouldn't feel very good so there are a

781

00:27:06,870 --> 00:27:04,559

few things within that sealed volume of

782

00:27:08,630 --> 00:27:06,880

the spacesuit that are culprits and i'm

783

00:27:10,390 --> 00:27:08,640

actually waiting to get the results of

784

00:27:12,549 --> 00:27:10,400

the investigation because i'd love to

785

00:27:13,909 --> 00:27:12,559

understand that more at this time i'm

786

00:27:15,990 --> 00:27:13,919

not sure what it was it definitely

787

00:27:17,590 --> 00:27:16,000

wasn't water and it wasn't my own sweat

788

00:27:19,350 --> 00:27:17,600

i've had my own sweat in my eyes plenty

789

00:27:20,630 --> 00:27:19,360

of times at the gym and it didn't feel

790

00:27:21,590 --> 00:27:20,640

like that

791

00:27:23,110 --> 00:27:21,600

wow

792

00:27:26,310 --> 00:27:23,120

incredible

793

00:27:27,990 --> 00:27:26,320

well congratulations with that

794

00:27:29,269 --> 00:27:28,000

let me ask you something you also you

795

00:27:32,149 --> 00:27:29,279

had uh

796

00:27:34,070 --> 00:27:32,159

you gave advice

797

00:27:35,830 --> 00:27:34,080

to uh

798

00:27:37,990 --> 00:27:35,840

you know to the iss and the group that

799

00:27:39,830 --> 00:27:38,000

just took off what did you get any good

800

00:27:42,070 --> 00:27:39,840

uh advice as you're a trainee that you

801
00:27:43,190 --> 00:27:42,080
applied that you that you when you're up

802
00:27:45,110 --> 00:27:43,200
there you thought you know what i'm glad

803
00:27:48,389 --> 00:27:45,120
they told me this

804
00:27:49,269 --> 00:27:48,399
oh so so often uh before flight even in

805
00:27:52,710 --> 00:27:49,279
flight

806
00:27:53,990 --> 00:27:52,720
some of the the things that really

807
00:27:56,470 --> 00:27:54,000
resonated

808
00:27:58,549 --> 00:27:56,480
before flight so in training someone

809
00:28:00,549 --> 00:27:58,559
said to me actually several people said

810
00:28:02,789 --> 00:28:00,559
it one of the primary things that we

811
00:28:04,070 --> 00:28:02,799
have to do as astronauts is to

812
00:28:07,029 --> 00:28:04,080
understand

813
00:28:09,350 --> 00:28:07,039

how the training isn't the same as the

814

00:28:11,590 --> 00:28:09,360

reality it's our job to integrate all

815

00:28:12,950 --> 00:28:11,600

the training and to to know how it's

816

00:28:15,269 --> 00:28:12,960

different than doing it in

817

00:28:17,669 --> 00:28:15,279

weightlessness and that is just so true

818

00:28:19,190 --> 00:28:17,679

you get there and everything has this

819

00:28:21,909 --> 00:28:19,200

one theme

820

00:28:24,230 --> 00:28:21,919

weightlessness and being in orbit can

821

00:28:26,950 --> 00:28:24,240

change everything the way you brush your

822

00:28:28,149 --> 00:28:26,960

teeth go to the bathroom eat drink and

823

00:28:30,789 --> 00:28:28,159

then of course

824

00:28:33,190 --> 00:28:30,799

maintenance science and spacewalks

825

00:28:35,350 --> 00:28:33,200

waking up and going to sleep and waking

826

00:28:37,029 --> 00:28:35,360

up again in weightlessness it's just

827

00:28:38,950 --> 00:28:37,039

something that you can't train for on

828

00:28:41,269 --> 00:28:38,960

earth and so you have to learn

829

00:28:42,870 --> 00:28:41,279

how to live like that and work like that

830

00:28:43,750 --> 00:28:42,880

once you get there it's on the job

831

00:28:45,590 --> 00:28:43,760

training

832

00:28:47,669 --> 00:28:45,600

another piece of advice before my first

833

00:28:50,549 --> 00:28:47,679

spacewalk was

834

00:28:52,549 --> 00:28:50,559

to keep your world small that was such a

835

00:28:54,470 --> 00:28:52,559

great thing to think about on your first

836

00:28:56,549 --> 00:28:54,480

spacewalk just going out there and

837

00:28:58,149 --> 00:28:56,559

focusing on one thing at a time because

838

00:29:00,310 --> 00:28:58,159

it's really easy to just want to look at

839

00:29:02,310 --> 00:29:00,320

the earth but that could be overwhelming

840

00:29:03,750 --> 00:29:02,320

and since i had never done it i didn't

841

00:29:06,310 --> 00:29:03,760

want to take a chance at you know

842

00:29:08,310 --> 00:29:06,320

putting myself in a situation where you

843

00:29:10,149 --> 00:29:08,320

know the anxiety or the nerves took over

844

00:29:12,070 --> 00:29:10,159

you know i i think of myself as a

845

00:29:14,310 --> 00:29:12,080

steely-eyed fighter pilot but i've never

846

00:29:15,990 --> 00:29:14,320

been 260 miles above the surface of the

847

00:29:17,750 --> 00:29:16,000

earth and been able to look down and see

848

00:29:20,070 --> 00:29:17,760

nothing under my feet so so i didn't

849

00:29:22,070 --> 00:29:20,080

want to take any chances and i slowly

850

00:29:24,950 --> 00:29:22,080

opened up that view and then was able to

851

00:29:26,950 --> 00:29:24,960

take in the earth in all its glory and

852

00:29:29,350 --> 00:29:26,960

it was amazing but i took my time

853

00:29:31,590 --> 00:29:29,360

getting there by starting small

854

00:29:33,990 --> 00:29:31,600

and then i would say my favorite piece

855

00:29:36,549 --> 00:29:34,000

of advice was something someone wrote on

856

00:29:39,269 --> 00:29:36,559

the space station we have a a sheet of

857

00:29:41,430 --> 00:29:39,279

paper taped to our exercise device that

858

00:29:43,430 --> 00:29:41,440

a red i was telling you about and it

859

00:29:45,190 --> 00:29:43,440

actually has an acronym please written

860

00:29:46,149 --> 00:29:45,200

down the side which tells you what to do

861

00:29:47,510 --> 00:29:46,159

to

862

00:29:48,710 --> 00:29:47,520

turn off the machine when you're done

863

00:29:50,950 --> 00:29:48,720

exercising

864

00:29:53,190 --> 00:29:50,960

but someone wrote a small message at the

865

00:29:54,710 --> 00:29:53,200

very bottom of it it says

866

00:29:56,389 --> 00:29:54,720

nothing is more important than what

867

00:29:58,070 --> 00:29:56,399

you're doing right now

868

00:30:00,630 --> 00:29:58,080

i took a picture of that and i sent it

869

00:30:02,710 --> 00:30:00,640

to my family and i sent it to my friends

870

00:30:04,070 --> 00:30:02,720

and i also suggested the crew that just

871

00:30:05,590 --> 00:30:04,080

got up there i didn't tell him what it

872

00:30:07,830 --> 00:30:05,600

was i just told him go look at the

873

00:30:09,990 --> 00:30:07,840

machine and the piece of paper i

874

00:30:11,990 --> 00:30:10,000

meditated on that daily every time i

875

00:30:13,990 --> 00:30:12,000

passed by it i read it and and even

876

00:30:15,830 --> 00:30:14,000

sometimes hourly i would tell myself

877

00:30:17,590 --> 00:30:15,840

that because it's really easy to focus

878

00:30:19,830 --> 00:30:17,600

on a space walk but you know what when i

879

00:30:21,830 --> 00:30:19,840

was repairing the toilet i thought this

880

00:30:23,990 --> 00:30:21,840

i it was just as important as going out

881

00:30:25,190 --> 00:30:24,000

into the vacuum of space nothing is more

882

00:30:27,190 --> 00:30:25,200

important than what you're doing right

883

00:30:29,750 --> 00:30:27,200

now because everything that we did in

884

00:30:30,870 --> 00:30:29,760

space was so vital

885

00:30:33,669 --> 00:30:30,880

i think that's

886

00:30:35,190 --> 00:30:33,679

that's words of wisdom for life down

887

00:30:36,630 --> 00:30:35,200

here on earth too it's it's an

888

00:30:39,029 --> 00:30:36,640

incredible thing

889

00:30:40,789 --> 00:30:39,039

you know when you talk about uh space

890

00:30:43,029 --> 00:30:40,799

when you were talking about your purview

891

00:30:44,630 --> 00:30:43,039

or your view getting expanding my

892

00:30:46,549 --> 00:30:44,640

question is have you

893

00:30:48,630 --> 00:30:46,559

have you skydived before have you gone

894

00:30:51,830 --> 00:30:48,640

through skydiving and scuba diving did

895

00:30:53,909 --> 00:30:51,840

you do a lot of that prior to this

896

00:30:56,389 --> 00:30:53,919

you know i've never been skydiving and i

897

00:30:58,870 --> 00:30:56,399

would love to i would love to do that uh

898

00:31:00,789 --> 00:30:58,880

and i hope uh nasa can integrate that

899

00:31:02,549 --> 00:31:00,799

into our training our cosmonaut

900

00:31:05,269 --> 00:31:02,559

colleagues do that as a part of their

901
00:31:07,190 --> 00:31:05,279
training and so uh maybe i need to go

902
00:31:09,110 --> 00:31:07,200
evaluate the cosmonaut training program

903
00:31:11,269 --> 00:31:09,120
so that i can do some skydiving but i

904
00:31:12,950 --> 00:31:11,279
did learn to scuba dive i actually

905
00:31:15,990 --> 00:31:12,960
learned to do it in guam while i was on

906
00:31:17,590 --> 00:31:16,000
a navy deployment there and uh before i

907
00:31:19,909 --> 00:31:17,600
became an astronaut and then as a part

908
00:31:22,230 --> 00:31:19,919
of this job when we train in the neutral

909
00:31:24,070 --> 00:31:22,240
buoyancy lab with the full pressure suit

910
00:31:26,310 --> 00:31:24,080
on that's considered full pressure suit

911
00:31:28,310 --> 00:31:26,320
diving but sometimes we'll do a practice

912
00:31:30,470 --> 00:31:28,320
run without all the other divers in the

913
00:31:33,110 --> 00:31:30,480

cameras by ourselves just with our buddy

914

00:31:35,269 --> 00:31:33,120

and we'll go down in scuba the the run

915

00:31:36,630 --> 00:31:35,279

before so we can see where things are

916

00:31:37,909 --> 00:31:36,640

how we're going to attack the problem

917

00:31:39,509 --> 00:31:37,919

with the tools

918

00:31:42,230 --> 00:31:39,519

and how we'll get out and back from the

919

00:31:44,710 --> 00:31:42,240

work site as a team and so we do lots of

920

00:31:47,269 --> 00:31:44,720

scuba diving in this job and that is

921

00:31:50,149 --> 00:31:47,279

flying and diving are two of the parts

922

00:31:50,950 --> 00:31:50,159

of this job that i love the most

923

00:31:52,389 --> 00:31:50,960

well

924

00:31:54,070 --> 00:31:52,399

it's a great job i've got to take you

925

00:31:55,029 --> 00:31:54,080

skydiving i'll take you skydiving i'll

926
00:31:57,830 --> 00:31:55,039
teach you

927
00:31:59,350 --> 00:31:57,840
yes yes please take it out we'll do that

928
00:32:01,029 --> 00:31:59,360
we'll do that okay i'll call you after

929
00:32:02,230 --> 00:32:01,039
all we'll i'll figure it out

930
00:32:05,110 --> 00:32:02,240
that'll be fun

931
00:32:07,909 --> 00:32:05,120
that would be really awesome

932
00:32:09,669 --> 00:32:07,919
so when you're up there was

933
00:32:11,750 --> 00:32:09,679
on the spacewalk was that the most

934
00:32:13,750 --> 00:32:11,760
astonishing view that you had was that

935
00:32:15,909 --> 00:32:13,760
the moment for you you know everyone

936
00:32:18,230 --> 00:32:15,919
talks about inside obviously the coppola

937
00:32:21,269 --> 00:32:18,240
we've seen those shots and film of that

938
00:32:23,909 --> 00:32:21,279

but outside and looking back at earth or

939

00:32:25,990 --> 00:32:23,919

you know what what other things what was

940

00:32:27,110 --> 00:32:26,000

did you see anything else or just share

941

00:32:29,750 --> 00:32:27,120

a little bit of that with us if you

942

00:32:31,350 --> 00:32:29,760

don't mind please wow absolutely you

943

00:32:34,389 --> 00:32:31,360

know because you're inside the space

944

00:32:36,070 --> 00:32:34,399

station the windows there you know it is

945

00:32:37,750 --> 00:32:36,080

a great view out of the cupola and we

946

00:32:40,549 --> 00:32:37,760

have other windows

947

00:32:43,430 --> 00:32:40,559

but when you're outside on a spacewalk

948

00:32:45,430 --> 00:32:43,440

that visor wraps around you so that you

949

00:32:48,070 --> 00:32:45,440

can you actually have peripheral view

950

00:32:50,149 --> 00:32:48,080

and so when you can see the the earth

951
00:32:52,549 --> 00:32:50,159
there's nothing besides that visor

952
00:32:55,430 --> 00:32:52,559
between you and the earth and the vacuum

953
00:32:58,470 --> 00:32:55,440
of space and so that is just the most

954
00:33:01,269 --> 00:32:58,480
unique way to see the earth from orbit

955
00:33:03,029 --> 00:33:01,279
and it is truly breathtaking that's why

956
00:33:04,549 --> 00:33:03,039
it's important to keep your world small

957
00:33:06,870 --> 00:33:04,559
if you walk out and the first thing you

958
00:33:08,710 --> 00:33:06,880
do is just stare at the earth i mean you

959
00:33:10,149 --> 00:33:08,720
may be stuck in that for several minutes

960
00:33:12,070 --> 00:33:10,159
and you've got work to do in those first

961
00:33:13,830 --> 00:33:12,080
few minutes and it's also important to

962
00:33:15,430 --> 00:33:13,840
keep your heart rate low in the first

963
00:33:16,870 --> 00:33:15,440

few minutes so i can tell you more about

964

00:33:19,269 --> 00:33:16,880

that later but

965

00:33:21,669 --> 00:33:19,279

that view is very special it is

966

00:33:24,310 --> 00:33:21,679

extremely special but i think the view

967

00:33:27,350 --> 00:33:24,320

that impacted me the most was the first

968

00:33:29,909 --> 00:33:27,360

time i saw the earth from orbit and that

969

00:33:32,230 --> 00:33:29,919

was after launch we got to orbit safely

970

00:33:34,070 --> 00:33:32,240

and now we had 27 hours before we were

971

00:33:36,470 --> 00:33:34,080

going to catch up to the space station

972

00:33:39,509 --> 00:33:36,480

and dock and so we had time to take off

973

00:33:41,909 --> 00:33:39,519

our suits and eat and go to the bathroom

974

00:33:43,830 --> 00:33:41,919

and i went to the to the the window and

975

00:33:45,430 --> 00:33:43,840

looked out and first of all the

976

00:33:46,870 --> 00:33:45,440

orientation of the earth i thought you

977

00:33:48,310 --> 00:33:46,880

know that i was just used to seeing the

978

00:33:49,830 --> 00:33:48,320

earth like you see it in this picture

979

00:33:52,389 --> 00:33:49,840

you know horizon there and the earth

980

00:33:53,990 --> 00:33:52,399

down and it was like sideways and i felt

981

00:33:55,110 --> 00:33:54,000

like i was underneath the earth and i'm

982

00:33:58,149 --> 00:33:55,120

looking out

983

00:34:00,310 --> 00:33:58,159

and i was just amazed at the view how

984

00:34:03,350 --> 00:34:00,320

much detail that i could see

985

00:34:05,669 --> 00:34:03,360

but then how much of that detail and so

986

00:34:07,509 --> 00:34:05,679

i just grabbed my ipad and i started

987

00:34:09,669 --> 00:34:07,519

recording a video

988

00:34:12,149 --> 00:34:09,679

and and it wasn't that i wanted to share

989

00:34:14,629 --> 00:34:12,159

the imagery with people i wanted to

990

00:34:16,950 --> 00:34:14,639

capture the feeling that i was just

991

00:34:19,990 --> 00:34:16,960

awestruck and i wanted to share that

992

00:34:23,510 --> 00:34:20,000

with people how how it impacted me and

993

00:34:25,750 --> 00:34:23,520

so um that really was a powerful moment

994

00:34:27,589 --> 00:34:25,760

and and you know i think the the the

995

00:34:29,750 --> 00:34:27,599

overview effect if you've heard about

996

00:34:32,389 --> 00:34:29,760

that seeing the world without borders

997

00:34:34,550 --> 00:34:32,399

without labels it just as it is seeing

998

00:34:37,190 --> 00:34:34,560

the the magnitude and the majesty but

999

00:34:39,190 --> 00:34:37,200

also the fragility of the planet has an

1000

00:34:41,190 --> 00:34:39,200

effect on on most people who get the

1001

00:34:42,470 --> 00:34:41,200

privilege of flying to space

1002

00:34:44,230 --> 00:34:42,480

but it also

1003

00:34:47,349 --> 00:34:44,240

since i've been back for a little over

1004

00:34:49,430 --> 00:34:47,359

six months now i realized that it's

1005

00:34:51,030 --> 00:34:49,440

important and it is amazing and it's a

1006

00:34:52,710 --> 00:34:51,040

privilege to see it but one of the

1007

00:34:55,829 --> 00:34:52,720

reasons that it's so powerful and it's

1008

00:34:58,390 --> 00:34:55,839

so impactful is because of what you've

1009

00:35:00,790 --> 00:34:58,400

built up over your life here on earth

1010

00:35:03,030 --> 00:35:00,800

seeing an entire ocean entire body of

1011

00:35:04,950 --> 00:35:03,040

water from space is amazing i could see

1012

00:35:07,030 --> 00:35:04,960

the entire ocean

1013

00:35:09,510 --> 00:35:07,040

but it makes you still want to stand on

1014

00:35:11,430 --> 00:35:09,520

the beach and walk in the surf and so

1015

00:35:13,430 --> 00:35:11,440

it's the fact that it connects to your

1016

00:35:15,589 --> 00:35:13,440

experience on earth

1017

00:35:16,550 --> 00:35:15,599

being in space just accelerates that and

1018

00:35:19,030 --> 00:35:16,560

makes you

1019

00:35:21,349 --> 00:35:19,040

appreciate the planet and appreciate the

1020

00:35:23,910 --> 00:35:21,359

life that it supports the fragility of

1021

00:35:26,150 --> 00:35:23,920

earth and the preciousness of human life

1022

00:35:28,630 --> 00:35:26,160

and so i it's one of my missions now to

1023

00:35:30,550 --> 00:35:28,640

try and remind people of that right here

1024

00:35:33,030 --> 00:35:30,560

on earth that we already start the

1025

00:35:35,910 --> 00:35:33,040

overview process the overview effect

1026

00:35:39,349 --> 00:35:35,920

starts right here in one g on the

1027

00:35:42,390 --> 00:35:39,359

surface of the earth with each other

1028

00:35:43,510 --> 00:35:42,400

that's spectacular that's really amazing

1029

00:35:46,470 --> 00:35:43,520

thank you

1030

00:35:48,310 --> 00:35:46,480

gave me new new images of what what that

1031

00:35:50,710 --> 00:35:48,320

experience uh must be like that's

1032

00:35:52,550 --> 00:35:50,720

amazing absolutely amazing

1033

00:35:54,390 --> 00:35:52,560

it's powerful the earth is amazing

1034

00:35:56,470 --> 00:35:54,400

that's amazing

1035

00:35:59,190 --> 00:35:56,480

it really is

1036

00:36:00,230 --> 00:35:59,200

well you know when you came back did

1037

00:36:02,230 --> 00:36:00,240

anything

1038

00:36:05,190 --> 00:36:02,240

you know in terms of

1039

00:36:08,230 --> 00:36:05,200

i know we talked about physically

1040

00:36:09,910 --> 00:36:08,240

calories and and nutrition was was the

1041

00:36:11,510 --> 00:36:09,920

food did you pick your food ahead of

1042

00:36:13,109 --> 00:36:11,520

time i mean these are like

1043

00:36:14,790 --> 00:36:13,119

did you

1044

00:36:16,230 --> 00:36:14,800

you know what physically what were you

1045

00:36:18,310 --> 00:36:16,240

going through what was it like eating

1046

00:36:20,069 --> 00:36:18,320

the food there did it change was it was

1047

00:36:22,390 --> 00:36:20,079

it different eating it

1048

00:36:24,230 --> 00:36:22,400

in 0g than it was on earth did you

1049

00:36:26,950 --> 00:36:24,240

change your calorie count did you change

1050

00:36:28,790 --> 00:36:26,960

your diet specifically for it did you

1051
00:36:31,030 --> 00:36:28,800
you know would you did you get advice

1052
00:36:32,790 --> 00:36:31,040
from nutritionists saying how it changed

1053
00:36:35,750 --> 00:36:32,800
or is it pretty much the same as on

1054
00:36:39,190 --> 00:36:35,760
earth as it is in the space station

1055
00:36:41,349 --> 00:36:39,200
yes oh a topic that i really care a lot

1056
00:36:43,430 --> 00:36:41,359
about i love to eat

1057
00:36:46,150 --> 00:36:43,440
and you know the the food on space

1058
00:36:48,069 --> 00:36:46,160
station is great we have great variety

1059
00:36:50,950 --> 00:36:48,079
and that's because we've spent years

1060
00:36:53,750 --> 00:36:50,960
improving it uh sort of going from like

1061
00:36:57,030 --> 00:36:53,760
mres like we have in the military to to

1062
00:36:59,589 --> 00:36:57,040
reducing the salt increasing variety

1063
00:37:01,270 --> 00:36:59,599

and options

1064

00:37:03,349 --> 00:37:01,280

we do pick a little bit of the food

1065

00:37:06,710 --> 00:37:03,359

there's a standard menu up there that we

1066

00:37:09,270 --> 00:37:06,720

all share and then we are able to pick

1067

00:37:11,030 --> 00:37:09,280

about 10 to 20 percent of our food and

1068

00:37:13,190 --> 00:37:11,040

they can even go depending on the

1069

00:37:14,630 --> 00:37:13,200

packaging and if it's if it will last

1070

00:37:16,710 --> 00:37:14,640

long enough because your food is up

1071

00:37:19,430 --> 00:37:16,720

there for a year or years before you get

1072

00:37:21,829 --> 00:37:19,440

there and so it has to have a safe

1073

00:37:24,870 --> 00:37:21,839

packaging and and be shelf stable for

1074

00:37:26,710 --> 00:37:24,880

long enough and so uh i i had lots of

1075

00:37:29,750 --> 00:37:26,720

advice we had nutritionists in a food

1076
00:37:31,589 --> 00:37:29,760
science lab where we can taste the foods

1077
00:37:33,510 --> 00:37:31,599
and the value in that is you know what

1078
00:37:34,870 --> 00:37:33,520
the entire menu is like but it also

1079
00:37:36,950 --> 00:37:34,880
gives you a chance to start thinking

1080
00:37:40,150 --> 00:37:36,960
about ways to combine and recombine the

1081
00:37:42,310 --> 00:37:40,160
food to add even more variety to it or

1082
00:37:44,710 --> 00:37:42,320
using one like i used a lot of tomato

1083
00:37:46,069 --> 00:37:44,720
basil soup as sauce for other things

1084
00:37:47,109 --> 00:37:46,079
putting it on the chicken breast for

1085
00:37:49,750 --> 00:37:47,119
example

1086
00:37:51,750 --> 00:37:49,760
it just added a little bit of flavor and

1087
00:37:54,069 --> 00:37:51,760
so those kinds of things are very

1088
00:37:56,470 --> 00:37:54,079

important i also got lots of advice from

1089

00:37:58,069 --> 00:37:56,480

my crewmates and in fact i don't think i

1090

00:37:59,430 --> 00:37:58,079

took that advice well enough when they

1091

00:38:01,349 --> 00:37:59,440

when they told me

1092

00:38:03,990 --> 00:38:01,359

really think about the stuff you can

1093

00:38:06,069 --> 00:38:04,000

choose i picked one or two things and i

1094

00:38:08,230 --> 00:38:06,079

was really happy that they had these dry

1095

00:38:09,910 --> 00:38:08,240

fruit strips that i really like and and

1096

00:38:12,150 --> 00:38:09,920

so i was like okay great and i've got my

1097

00:38:14,710 --> 00:38:12,160

coffee and i wish i would have spent

1098

00:38:16,550 --> 00:38:14,720

more time and like gone to the store and

1099

00:38:19,270 --> 00:38:16,560

dedicated some time to looking at

1100

00:38:20,710 --> 00:38:19,280

different things and and seeing hey i

1101

00:38:23,349 --> 00:38:20,720

could get that i could have a few of

1102

00:38:25,990 --> 00:38:23,359

these and adding even more variety just

1103

00:38:28,150 --> 00:38:26,000

maximizing variety and taste and

1104

00:38:30,150 --> 00:38:28,160

textures because of six months of eating

1105

00:38:32,790 --> 00:38:30,160

the same things it is really easy for it

1106

00:38:34,950 --> 00:38:32,800

to become boring and and routine and so

1107

00:38:37,349 --> 00:38:34,960

we constantly are finding ways to to to

1108

00:38:39,589 --> 00:38:37,359

adapt and and keep it interesting but

1109

00:38:42,150 --> 00:38:39,599

yes eating in space you adapt you know

1110

00:38:43,829 --> 00:38:42,160

utensils you don't use utensils like you

1111

00:38:46,150 --> 00:38:43,839

do on earth you don't scoop out your

1112

00:38:47,510 --> 00:38:46,160

soup honestly you cut the corner off not

1113

00:38:48,870 --> 00:38:47,520

all the way off because now you've

1114

00:38:50,150 --> 00:38:48,880

created a little piece of trash that's

1115

00:38:52,150 --> 00:38:50,160

gonna float away that you have to go

1116

00:38:53,589 --> 00:38:52,160

chase you just cut the corner open

1117

00:38:55,030 --> 00:38:53,599

enough so that you can get the soup out

1118

00:38:56,710 --> 00:38:55,040

and you just you kind of suck it out of

1119

00:38:59,589 --> 00:38:56,720

the bag we we do a lot of eating like

1120

00:39:01,430 --> 00:38:59,599

kids do like like toddlers drink and and

1121

00:39:03,270 --> 00:39:01,440

and they eat their food out of pouches

1122

00:39:05,750 --> 00:39:03,280

we we do that often and so you don't

1123

00:39:06,710 --> 00:39:05,760

need utensils as much as as you do on

1124

00:39:08,550 --> 00:39:06,720

earth

1125

00:39:09,990 --> 00:39:08,560

drinking water you know you need to be

1126

00:39:11,829 --> 00:39:10,000

careful because

1127

00:39:12,790 --> 00:39:11,839

the water floats or all of your drinks

1128

00:39:14,870 --> 00:39:12,800

float

1129

00:39:17,589 --> 00:39:14,880

and so you have to really be intentional

1130

00:39:20,230 --> 00:39:17,599

i when i first got there i was trying to

1131

00:39:21,750 --> 00:39:20,240

have a a drink and i was talking to one

1132

00:39:23,910 --> 00:39:21,760

of my crewmates and i briefly choked and

1133

00:39:25,589 --> 00:39:23,920

i was like okay no more talking and

1134

00:39:26,870 --> 00:39:25,599

drinking i'm just going to focus on one

1135

00:39:29,109 --> 00:39:26,880

at a time

1136

00:39:31,109 --> 00:39:29,119

because uh this is a new challenge and

1137

00:39:32,470 --> 00:39:31,119

so it definitely changes the mode in

1138

00:39:34,310 --> 00:39:32,480

which you do those things and and

1139

00:39:36,230 --> 00:39:34,320

there's just things that you have to

1140

00:39:38,150 --> 00:39:36,240

learn in space and you have to learn the

1141

00:39:39,030 --> 00:39:38,160

lessons space has to teach you hot

1142

00:39:45,109 --> 00:39:39,040

things

1143

00:39:47,430 --> 00:39:45,119

you know on earth when something is warm

1144

00:39:49,349 --> 00:39:47,440

like your coffee in a mug the warm air

1145

00:39:51,030 --> 00:39:49,359

is less dense and so it wafts up and you

1146

00:39:53,270 --> 00:39:51,040

can smell it and you don't have that

1147

00:39:54,950 --> 00:39:53,280

sense of smell in space you have fluid

1148

00:39:56,950 --> 00:39:54,960

shift which makes you feel a little more

1149

00:39:58,790 --> 00:39:56,960

congested and you also don't have

1150

00:40:01,510 --> 00:39:58,800

gravity to create that differential that

1151
00:40:04,230 --> 00:40:01,520
makes warm things rise so your foods

1152
00:40:06,069 --> 00:40:04,240
don't smell as strong and it affects the

1153
00:40:08,790 --> 00:40:06,079
taste and so we use a lot of condiments

1154
00:40:11,430 --> 00:40:08,800
to to make things taste better

1155
00:40:13,430 --> 00:40:11,440
but also you don't have the sensation of

1156
00:40:14,710 --> 00:40:13,440
heat when you pull a hot package out of

1157
00:40:16,790 --> 00:40:14,720
the the

1158
00:40:18,630 --> 00:40:16,800
food warmer it's not if you're not

1159
00:40:20,150 --> 00:40:18,640
holding it you don't sense the heat like

1160
00:40:22,950 --> 00:40:20,160
you do on a hot plate of food with the

1161
00:40:24,470 --> 00:40:22,960
warm air rising up to you so you really

1162
00:40:27,109 --> 00:40:24,480
need to check the temperatures of your

1163
00:40:29,430 --> 00:40:27,119

food when i ate my first bag of warm

1164

00:40:32,230 --> 00:40:29,440

tomato basil soup my first one in space

1165

00:40:34,790 --> 00:40:32,240

was cold the first time i heated it up i

1166

00:40:36,950 --> 00:40:34,800

cut the package open i made a big cut

1167

00:40:39,109 --> 00:40:36,960

too big and so soup was starting to come

1168

00:40:41,349 --> 00:40:39,119

up out of it and i put my face down by

1169

00:40:42,390 --> 00:40:41,359

it and the soup as soon as it touches

1170

00:40:44,309 --> 00:40:42,400

your lip

1171

00:40:45,990 --> 00:40:44,319

surface tension and capillary action

1172

00:40:47,910 --> 00:40:46,000

take over and it wants to spread over

1173

00:40:49,510 --> 00:40:47,920

your face and so

1174

00:40:52,069 --> 00:40:49,520

that's how i found out that it was

1175

00:40:53,510 --> 00:40:52,079

really hot and so i grabbed it off my

1176

00:40:55,109 --> 00:40:53,520

face with my hand

1177

00:40:57,030 --> 00:40:55,119

but but it was really warm and i

1178

00:40:58,550 --> 00:40:57,040

surprised myself and so

1179

00:41:00,309 --> 00:40:58,560

that's not something you think about on

1180

00:41:01,910 --> 00:41:00,319

earth because you can sense the heat and

1181

00:41:04,150 --> 00:41:01,920

then you can get a spoon out and sort of

1182

00:41:06,550 --> 00:41:04,160

slurp it and check it and in space you

1183

00:41:08,150 --> 00:41:06,560

just have to really be careful about

1184

00:41:10,870 --> 00:41:08,160

your hot foods and that's just true

1185

00:41:12,870 --> 00:41:10,880

about everything space requires constant

1186

00:41:15,270 --> 00:41:12,880

attention it is mentally fatiguing

1187

00:41:17,349 --> 00:41:15,280

because everything you do requires

1188

00:41:20,550 --> 00:41:17,359

constant attention

1189

00:41:24,230 --> 00:41:20,560

yeah the temperature inside the iss

1190

00:41:25,430 --> 00:41:24,240

i mean obviously it's closely monitored

1191

00:41:27,190 --> 00:41:25,440

uh

1192

00:41:29,910 --> 00:41:27,200

how did that feel for you

1193

00:41:31,270 --> 00:41:29,920

the atmosphere inside the

1194

00:41:35,109 --> 00:41:31,280

the air

1195

00:41:38,790 --> 00:41:35,119

the was there any other things in terms

1196

00:41:40,309 --> 00:41:38,800

of the electronics of the iss and did

1197

00:41:42,550 --> 00:41:40,319

you feel the difference being in that

1198

00:41:44,870 --> 00:41:42,560

space i mean just the emfs or you talk

1199

00:41:46,550 --> 00:41:44,880

about radiation you know those those

1200

00:41:49,829 --> 00:41:46,560

things in terms of being surrounded by

1201
00:41:52,230 --> 00:41:49,839
so many electrical uh devices and the

1202
00:41:53,510 --> 00:41:52,240
radiation did you could you tell and

1203
00:41:56,230 --> 00:41:53,520
feel a different

1204
00:41:58,550 --> 00:41:56,240
environment with that on your body

1205
00:42:00,550 --> 00:41:58,560
yes it's interesting the entire space

1206
00:42:02,630 --> 00:42:00,560
station is controlled to about 22

1207
00:42:04,790 --> 00:42:02,640
degrees celsius 72

1208
00:42:07,670 --> 00:42:04,800
degrees fahrenheit and and so it feels

1209
00:42:09,589 --> 00:42:07,680
very much like your your home except for

1210
00:42:11,270 --> 00:42:09,599
all the air moves in space station

1211
00:42:13,750 --> 00:42:11,280
because of a fan you know there's no

1212
00:42:16,069 --> 00:42:13,760
natural circulation and so because of

1213
00:42:17,670 --> 00:42:16,079

that if you stand in one place too long

1214

00:42:20,309 --> 00:42:17,680

and you talk as much as i'm speaking

1215

00:42:22,710 --> 00:42:20,319

right now you build up a bubble of co2

1216

00:42:24,309 --> 00:42:22,720

you know and that definitely has effects

1217

00:42:27,190 --> 00:42:24,319

one of the most common effects of of

1218

00:42:28,790 --> 00:42:27,200

high levels of co2 are headaches um and

1219

00:42:30,390 --> 00:42:28,800

so you can also experience air hunger

1220

00:42:32,790 --> 00:42:30,400

kind of like the sensation just before

1221

00:42:34,309 --> 00:42:32,800

you yawn and so those are things that

1222

00:42:35,990 --> 00:42:34,319

happen that that are kind of kind of

1223

00:42:37,990 --> 00:42:36,000

compartmentalized depending on where you

1224

00:42:39,510 --> 00:42:38,000

are in the activity that you're doing if

1225

00:42:41,829 --> 00:42:39,520

you're working in one area for a long

1226
00:42:44,309 --> 00:42:41,839
time you may want to have an extra fan

1227
00:42:46,069 --> 00:42:44,319
bring a fan with you to blow air out as

1228
00:42:48,870 --> 00:42:46,079
you're as you're sitting there breathing

1229
00:42:50,790 --> 00:42:48,880
and adding co2 um but the temperature

1230
00:42:52,230 --> 00:42:50,800
was very comfortable but depending on

1231
00:42:54,069 --> 00:42:52,240
where you're working sometimes i would

1232
00:42:56,150 --> 00:42:54,079
go up on the overhead and we generally

1233
00:42:57,750 --> 00:42:56,160
would have inlets on the deck and and

1234
00:42:59,910 --> 00:42:57,760
the outlets for the air conditioning

1235
00:43:02,550 --> 00:42:59,920
were overhead so when i would be working

1236
00:43:04,630 --> 00:43:02,560
up on on the ceiling on the overhead i

1237
00:43:06,550 --> 00:43:04,640
would be really close to the airflow and

1238
00:43:08,550 --> 00:43:06,560

and you know with this haircut it was

1239

00:43:09,990 --> 00:43:08,560

easy to lose a lot of heat and so when i

1240

00:43:11,990 --> 00:43:10,000

was working on the overhead i would grab

1241

00:43:13,990 --> 00:43:12,000

a hat or a knit cap and i would wear

1242

00:43:16,309 --> 00:43:14,000

that and even sometimes i would put on

1243

00:43:18,069 --> 00:43:16,319

my hoodie just because if my head was

1244

00:43:20,790 --> 00:43:18,079

losing heat it made my entire body feel

1245

00:43:23,190 --> 00:43:20,800

cold and so it really was was local

1246

00:43:25,349 --> 00:43:23,200

specific the entire space station was

1247

00:43:26,950 --> 00:43:25,359

very comfortable

1248

00:43:28,550 --> 00:43:26,960

but depending on where you worked you

1249

00:43:31,670 --> 00:43:28,560

may want to be in your short sleeves or

1250

00:43:33,990 --> 00:43:31,680

you may need a jacket to stay warm and

1251
00:43:35,750 --> 00:43:34,000
then the smell it's very interesting

1252
00:43:37,430 --> 00:43:35,760
when you first get to space station is

1253
00:43:39,270 --> 00:43:37,440
when you notice the smell the strongest

1254
00:43:41,990 --> 00:43:39,280
because you kind of get saturated and

1255
00:43:43,829 --> 00:43:42,000
you get used to it after but it was a an

1256
00:43:46,069 --> 00:43:43,839
interesting combination and again it's

1257
00:43:48,069 --> 00:43:46,079
also local when you go into the module

1258
00:43:49,990 --> 00:43:48,079
that has the the lifting the strength

1259
00:43:51,910 --> 00:43:50,000
training equipment that's also where the

1260
00:43:54,630 --> 00:43:51,920
bathroom is so that's the most

1261
00:43:56,950 --> 00:43:54,640
odoriferous module that one smells like

1262
00:44:00,230 --> 00:43:56,960
a locker room and so the overall space

1263
00:44:05,030 --> 00:44:00,240

station it smells very much like a

1264

00:44:09,109 --> 00:44:06,470

sterile

1265

00:44:11,030 --> 00:44:09,119

metallic quality to it and it very much

1266

00:44:14,230 --> 00:44:11,040

smells like a work space you know when

1267

00:44:16,309 --> 00:44:14,240

you walk into a hospital you sense that

1268

00:44:19,190 --> 00:44:16,319

yeah this smells like a hospital it's

1269

00:44:20,870 --> 00:44:19,200

got this antiseptic germ-free quality

1270

00:44:22,870 --> 00:44:20,880

and so we work really hard to keep it

1271

00:44:24,470 --> 00:44:22,880

clean and it just you know between all

1272

00:44:26,470 --> 00:44:24,480

the machines and the fans on the

1273

00:44:28,710 --> 00:44:26,480

computers and the and the the power

1274

00:44:32,230 --> 00:44:28,720

boxes on all the hardware there's this

1275

00:44:34,470 --> 00:44:32,240

hum and there's a smell there's a visual

1276

00:44:36,470 --> 00:44:34,480

and and there's a sound of the space

1277

00:44:38,710 --> 00:44:36,480

station that kind of it's almost like a

1278

00:44:41,109 --> 00:44:38,720

living thing and and it's neat because

1279

00:44:43,109 --> 00:44:41,119

if that ever changes you know the ground

1280

00:44:44,550 --> 00:44:43,119

did something or something broke and all

1281

00:44:46,630 --> 00:44:44,560

of us would hear something shut down and

1282

00:44:48,710 --> 00:44:46,640

go oh something just changed and and the

1283

00:44:50,550 --> 00:44:48,720

ground would call you so you get used to

1284

00:44:52,069 --> 00:44:50,560

all of those those qualities of the

1285

00:44:53,829 --> 00:44:52,079

space station it's almost like another

1286

00:44:54,950 --> 00:44:53,839

crew member up there that you get used

1287

00:44:57,750 --> 00:44:54,960

to the personality and the

1288

00:44:59,990 --> 00:44:57,760

characteristics of iss

1289

00:45:03,670 --> 00:45:00,000

so it's always that electronic sound

1290

00:45:06,470 --> 00:45:03,680

throughout you just but that never stops

1291

00:45:09,589 --> 00:45:06,480

all the fans and electronics there's a

1292

00:45:11,829 --> 00:45:09,599

word a hum that just is continuous and

1293

00:45:13,589 --> 00:45:11,839

if that ever stops and it gets quiet

1294

00:45:15,589 --> 00:45:13,599

quiet would actually make us all go

1295

00:45:17,510 --> 00:45:15,599

uh-oh what's wrong did we just lose

1296

00:45:20,150 --> 00:45:17,520

power what happened because there's

1297

00:45:23,190 --> 00:45:20,160

always some machine running 24 hours a

1298

00:45:24,790 --> 00:45:23,200

day 365 366 in a leap year it's always

1299

00:45:26,390 --> 00:45:24,800

moving

1300

00:45:28,710 --> 00:45:26,400

so you feel the vibration when you're

1301

00:45:30,390 --> 00:45:28,720

sleeping was it hard to make yourself

1302

00:45:32,390 --> 00:45:30,400

fall asleep and stay on a schedule with

1303

00:45:35,430 --> 00:45:32,400

that did you feel the vibration you're

1304

00:45:37,750 --> 00:45:35,440

hearing the noise did you have earplugs

1305

00:45:39,510 --> 00:45:37,760

uh we we have earplugs we also have you

1306

00:45:41,030 --> 00:45:39,520

know sleep medication if you need it if

1307

00:45:42,950 --> 00:45:41,040

you wake up and you have trouble going

1308

00:45:43,829 --> 00:45:42,960

back to sleep we have lots of options

1309

00:45:46,309 --> 00:45:43,839

there

1310

00:45:48,150 --> 00:45:46,319

i think i was very fortunate i did not

1311

00:45:50,230 --> 00:45:48,160

use earplugs because i wanted to be able

1312

00:45:51,589 --> 00:45:50,240

to hear if the ground called us or if

1313

00:45:53,589 --> 00:45:51,599

there was an alarm in the middle of the

1314

00:45:55,430 --> 00:45:53,599

night and we actually had several about

1315

00:45:56,950 --> 00:45:55,440

a half a dozen times where we were woken

1316

00:45:59,910 --> 00:45:56,960

up in the middle of the night

1317

00:46:01,670 --> 00:45:59,920

once it was three times in one night and

1318

00:46:03,829 --> 00:46:01,680

uh and you don't ever want to discount

1319

00:46:07,349 --> 00:46:03,839

them you want to take each one seriously

1320

00:46:09,430 --> 00:46:07,359

uh and so i wanted to hear but i i i

1321

00:46:11,510 --> 00:46:09,440

didn't have trouble falling asleep and a

1322

00:46:13,990 --> 00:46:11,520

part of that is because we sleep in crew

1323

00:46:15,990 --> 00:46:14,000

quarters all of us except our commander

1324

00:46:18,390 --> 00:46:16,000

we we increased the normal size of the

1325

00:46:20,470 --> 00:46:18,400

space station crew from six to seven and

1326
00:46:22,630 --> 00:46:20,480
so we didn't yet have an extra room we

1327
00:46:24,390 --> 00:46:22,640
call them crew quarters uh and they're

1328
00:46:26,950 --> 00:46:24,400
padded on the inside so when you shut

1329
00:46:29,670 --> 00:46:26,960
the door it has its own fan and other

1330
00:46:31,430 --> 00:46:29,680
than that fan and your computer or

1331
00:46:33,589 --> 00:46:31,440
music if you have music playing you

1332
00:46:35,270 --> 00:46:33,599
don't hear much when you're in your crew

1333
00:46:37,750 --> 00:46:35,280
quarters and that's great you can hop in

1334
00:46:39,829 --> 00:46:37,760
your sleeping bag and for me i i didn't

1335
00:46:41,990 --> 00:46:39,839
like to tie my sleeping bag down very

1336
00:46:44,390 --> 00:46:42,000
tight some people tried to recreate the

1337
00:46:46,390 --> 00:46:44,400
sensation of sleeping on earth and they

1338
00:46:48,390 --> 00:46:46,400

would put a pillow and try to squeeze

1339

00:46:50,790 --> 00:46:48,400

themselves up up against the wall and

1340

00:46:53,270 --> 00:46:50,800

create the sense of pressure that was

1341

00:46:55,670 --> 00:46:53,280

would mimic laying down and i just tried

1342

00:46:58,069 --> 00:46:55,680

to embrace the floating and so i tied my

1343

00:46:59,829 --> 00:46:58,079

sleeping bag at the waist in two places

1344

00:47:01,109 --> 00:46:59,839

and the rest of it i let it float and so

1345

00:47:03,589 --> 00:47:01,119

i just slept out in the middle of the

1346

00:47:06,390 --> 00:47:03,599

module and my body was in whatever its

1347

00:47:08,950 --> 00:47:06,400

normal relaxed position was and i slept

1348

00:47:11,349 --> 00:47:08,960

great i slept great on on the space

1349

00:47:13,430 --> 00:47:11,359

station and i actually needed less sleep

1350

00:47:15,270 --> 00:47:13,440

i averaged seven hours a night and on

1351
00:47:17,750 --> 00:47:15,280
earth i tried to get eight hours a night

1352
00:47:19,510 --> 00:47:17,760
but at seven hours i could my eyes would

1353
00:47:20,950 --> 00:47:19,520
fly open and i would be rested and ready

1354
00:47:22,470 --> 00:47:20,960
to start the day that was very

1355
00:47:24,069 --> 00:47:22,480
interesting

1356
00:47:25,670 --> 00:47:24,079
and did you feel a difference in your

1357
00:47:27,829 --> 00:47:25,680
sleep on earth

1358
00:47:30,069 --> 00:47:27,839
from when you came back did it when you

1359
00:47:33,510 --> 00:47:30,079
when the gravity did it change any did

1360
00:47:36,150 --> 00:47:33,520
you feel any physical effects

1361
00:47:38,309 --> 00:47:36,160
um coming back to earth i had to get

1362
00:47:40,390 --> 00:47:38,319
used to lying down again and and then

1363
00:47:42,870 --> 00:47:40,400

especially sitting up my midsection was

1364

00:47:45,589 --> 00:47:42,880

so weak so weak compared to before i

1365

00:47:48,230 --> 00:47:45,599

flew that when i would sit up it was a

1366

00:47:50,069 --> 00:47:48,240

concerted effort you know and then just

1367

00:47:52,309 --> 00:47:50,079

getting stable and then standing up that

1368

00:47:54,230 --> 00:47:52,319

was an interesting thing to lie down all

1369

00:47:56,309 --> 00:47:54,240

night and then sit up

1370

00:47:58,710 --> 00:47:56,319

but but overall the sleep quality i

1371

00:48:01,829 --> 00:47:58,720

think my sleep once i was asleep was

1372

00:48:03,750 --> 00:48:01,839

very much in space like it was on earth

1373

00:48:06,390 --> 00:48:03,760

and that was nice because sleep is very

1374

00:48:08,390 --> 00:48:06,400

important to me just food sleep

1375

00:48:09,910 --> 00:48:08,400

flying those are things that i very much

1376

00:48:11,349 --> 00:48:09,920

love

1377

00:48:13,349 --> 00:48:11,359

i appreciate that

1378

00:48:16,150 --> 00:48:13,359

by the way speaking of flying i'm i'm

1379

00:48:19,990 --> 00:48:16,160

talking to you now uh from england at a

1380

00:48:22,390 --> 00:48:20,000

great uh you know airfield duxford

1381

00:48:24,630 --> 00:48:22,400

at the uh it's a restoration center this

1382

00:48:26,069 --> 00:48:24,640

is a spitfire behind me right here you

1383

00:48:28,630 --> 00:48:26,079

know so these guys i don't know if you

1384

00:48:31,109 --> 00:48:28,640

can see it on the scene

1385

00:48:33,829 --> 00:48:31,119

i can and it's beautiful mark told me

1386

00:48:35,510 --> 00:48:33,839

where you are and that is i'm jealous uh

1387

00:48:37,510 --> 00:48:35,520

this is a cool view but there's no

1388

00:48:39,349 --> 00:48:37,520

airplane behind me that's that's awesome

1389

00:48:40,870 --> 00:48:39,359

that's a very cool view this this

1390

00:48:42,230 --> 00:48:40,880

airplane you know that's what we're

1391

00:48:44,309 --> 00:48:42,240

doing we're

1392

00:48:46,470 --> 00:48:44,319

flying a bunch of stuff and

1393

00:48:49,030 --> 00:48:46,480

you know working on we're releasing top

1394

00:48:50,950 --> 00:48:49,040

gun and we're working on missions so

1395

00:48:53,109 --> 00:48:50,960

being a fighter

1396

00:48:54,790 --> 00:48:53,119

i know man we're gonna i'll be flying

1397

00:48:56,630 --> 00:48:54,800

this thing when i get off here we're

1398

00:48:58,870 --> 00:48:56,640

gonna go fly some spitfires we got

1399

00:49:00,549 --> 00:48:58,880

mustang here too oh very cool

1400

00:49:01,589 --> 00:49:00,559

wow

1401

00:49:03,190 --> 00:49:01,599

if you're ever

1402

00:49:05,349 --> 00:49:03,200

where are you now are you in uh

1403

00:49:07,270 --> 00:49:05,359

california where are you

1404

00:49:09,589 --> 00:49:07,280

i'm in houston

1405

00:49:10,630 --> 00:49:09,599

just south houston

1406

00:49:13,270 --> 00:49:10,640

where you tell me you ever get to

1407

00:49:16,470 --> 00:49:13,280

california i have a p-51 out there you

1408

00:49:20,150 --> 00:49:16,480

you go have a flight if you want it you

1409

00:49:23,190 --> 00:49:20,160

just tell me okay so p51

1410

00:49:28,309 --> 00:49:27,190

oh you okay you had me at hello yes sign

1411

00:49:30,950 --> 00:49:28,319

me up

1412

00:49:33,430 --> 00:49:30,960

i i flew 35 airplanes in test pilot

1413

00:49:34,710 --> 00:49:33,440

school and two that i never got to fly

1414

00:49:36,390 --> 00:49:34,720

that i always wanted to fly were the

1415

00:49:39,430 --> 00:49:36,400

f-14 tomcat

1416

00:49:41,270 --> 00:49:39,440

and the p51 mustang this test pilot

1417

00:49:43,190 --> 00:49:41,280

school wasn't able to get a p-51 that

1418

00:49:46,470 --> 00:49:43,200

year sometimes they do but we didn't get

1419

00:49:47,829 --> 00:49:46,480

one so that's on my bucket list

1420

00:49:49,670 --> 00:49:47,839

well good man i'm gonna i'm gonna get

1421

00:49:50,710 --> 00:49:49,680

that bucket list for you we've got some

1422

00:49:52,630 --> 00:49:50,720

good pilots

1423

00:49:54,069 --> 00:49:52,640

taking you through it awesome thank you

1424

00:49:55,829 --> 00:49:54,079

thank you

1425

00:49:57,349 --> 00:49:55,839

we'll get that done

1426

00:49:58,870 --> 00:49:57,359

now let me see we talked through your

1427

00:50:00,630 --> 00:49:58,880

science experiments i'm going to kind of

1428

00:50:02,390 --> 00:50:00,640

look at the questions i that we had

1429

00:50:04,870 --> 00:50:02,400

written down i want to make sure

1430

00:50:05,910 --> 00:50:04,880

you know we went through the sleep

1431

00:50:07,670 --> 00:50:05,920

okay

1432

00:50:10,069 --> 00:50:07,680

and you know one of the things that i'd

1433

00:50:12,549 --> 00:50:10,079

like to discuss also is the the team

1434

00:50:14,390 --> 00:50:12,559

dynamic the preparation for that i mean

1435

00:50:16,230 --> 00:50:14,400

being in such close quarters

1436

00:50:18,390 --> 00:50:16,240

you know uh obviously you went through

1437

00:50:20,230 --> 00:50:18,400

the air force academy you know you know

1438

00:50:21,829 --> 00:50:20,240

the preparation you know understand the

1439

00:50:24,870 --> 00:50:21,839

military

1440

00:50:27,349 --> 00:50:24,880

teamwork and the flow of communication

1441

00:50:30,630 --> 00:50:27,359

was that different with the iss was that

1442

00:50:33,829 --> 00:50:30,640

different this team is there you know

1443

00:50:35,750 --> 00:50:33,839

did you find in terms of

1444

00:50:37,589 --> 00:50:35,760

everyone under stress or personal

1445

00:50:39,430 --> 00:50:37,599

conflict and how to resolve those

1446

00:50:42,150 --> 00:50:39,440

conflicts when you're there so that it's

1447

00:50:44,150 --> 00:50:42,160

it's did you guys have to have uh you

1448

00:50:46,230 --> 00:50:44,160

know those kind that kind of training in

1449

00:50:48,870 --> 00:50:46,240

terms of dealing with that those

1450

00:50:50,870 --> 00:50:48,880

situations when they arise

1451

00:50:53,190 --> 00:50:50,880

absolutely absolutely and i think it's

1452

00:50:55,750 --> 00:50:53,200

time well spent and that's what i would

1453

00:50:58,309 --> 00:50:55,760

say is it takes intention and it takes

1454

00:51:00,390 --> 00:50:58,319

time you have to put in work uh for

1455

00:51:02,870 --> 00:51:00,400

self-care learning how to take care of

1456

00:51:04,870 --> 00:51:02,880

yourself and understanding uh what what

1457

00:51:07,670 --> 00:51:04,880

gets you going and what what makes you

1458

00:51:09,910 --> 00:51:07,680

stop and and then also team care how you

1459

00:51:12,230 --> 00:51:09,920

fit into the role of a high performing

1460

00:51:14,390 --> 00:51:12,240

high functioning team that has to work

1461

00:51:18,630 --> 00:51:14,400

in this isolated confined and extreme

1462

00:51:21,349 --> 00:51:18,640

environment and so uh i think the uh the

1463

00:51:23,589 --> 00:51:21,359

the effort that we take on the ground in

1464

00:51:26,150 --> 00:51:23,599

training is really to give you a tool

1465

00:51:28,069 --> 00:51:26,160

bag a set of tools that you can use when

1466

00:51:30,790 --> 00:51:28,079

you need them and it's important to

1467

00:51:31,670 --> 00:51:30,800

understand them as a suite of tools

1468

00:51:33,829 --> 00:51:31,680

because

1469

00:51:35,109 --> 00:51:33,839

just like space walking and science you

1470

00:51:37,270 --> 00:51:35,119

really don't know what it's like until

1471

00:51:39,670 --> 00:51:37,280

you get there there's a part of your

1472

00:51:41,750 --> 00:51:39,680

mission that is going to affect you

1473

00:51:43,190 --> 00:51:41,760

socially and emotionally and you don't

1474

00:51:45,190 --> 00:51:43,200

know how that's going to affect you

1475

00:51:47,589 --> 00:51:45,200

until you get there for example on earth

1476

00:51:49,670 --> 00:51:47,599

i would consider myself an extroverts

1477

00:51:51,910 --> 00:51:49,680

extrovert a type a extrovert i love

1478

00:51:53,750 --> 00:51:51,920

being with people and and communicating

1479

00:51:57,030 --> 00:51:53,760

and telling stories and hearing stories

1480

00:51:59,589 --> 00:51:57,040

and that gives me energy on the iss

1481

00:52:02,630 --> 00:51:59,599

if i had a free moment i wanted to be by

1482

00:52:04,790 --> 00:52:02,640

myself because you're constantly engaged

1483

00:52:07,030 --> 00:52:04,800

with things and people and getting

1484

00:52:09,750 --> 00:52:07,040

instruction and giving a report and

1485

00:52:12,630 --> 00:52:09,760

there's so much extrovertism that i

1486

00:52:14,710 --> 00:52:12,640

needed to just be by myself to recharge

1487

00:52:17,109 --> 00:52:14,720

and that surprised me and so so it's

1488

00:52:20,069 --> 00:52:17,119

important to have your tools so that in

1489

00:52:22,309 --> 00:52:20,079

in space in the moment you can actually

1490

00:52:24,549 --> 00:52:22,319

contrive something you can use the basic

1491

00:52:26,390 --> 00:52:24,559

building blocks that we study on earth

1492

00:52:28,549 --> 00:52:26,400

to create whatever it is that you need

1493

00:52:30,390 --> 00:52:28,559

when you're in the environment uh i like

1494

00:52:32,549 --> 00:52:30,400

to tell this story about you know

1495

00:52:33,990 --> 00:52:32,559

working together it's important to train

1496

00:52:36,390 --> 00:52:34,000

with folks on the ground so that you

1497

00:52:38,309 --> 00:52:36,400

know them and mike hopkins our dragon

1498

00:52:40,309 --> 00:52:38,319

commander he and i were together for

1499

00:52:42,069 --> 00:52:40,319

three years prior to this mission and

1500

00:52:43,990 --> 00:52:42,079

over time we developed a couple of

1501
00:52:45,829 --> 00:52:44,000
things we we would say hey if we're ever

1502
00:52:47,349 --> 00:52:45,839
talking to the ground and you hear me

1503
00:52:49,510 --> 00:52:47,359
say something and you think i'm being

1504
00:52:51,109 --> 00:52:49,520
too pushy uh you know we both played

1505
00:52:53,910 --> 00:52:51,119
college football and so we came up with

1506
00:52:55,589 --> 00:52:53,920
this saying take a knee take a knee and

1507
00:52:57,910 --> 00:52:55,599
that was if we thought we were being too

1508
00:53:00,390 --> 00:52:57,920
pushy with the ground or or with each

1509
00:53:02,710 --> 00:53:00,400
other take a knee and we we agreed we

1510
00:53:04,950 --> 00:53:02,720
had trust in each other uh that if we

1511
00:53:06,870 --> 00:53:04,960
ever heard that it was an automatic stop

1512
00:53:09,829 --> 00:53:06,880
and then we would do whatever our other

1513
00:53:11,990 --> 00:53:09,839

crewmates suggested and we also came up

1514

00:53:13,829 --> 00:53:12,000

with another saying over time that was

1515

00:53:15,750 --> 00:53:13,839

if we were doing something that uh you

1516

00:53:17,430 --> 00:53:15,760

know maybe seemed tedious or we had just

1517

00:53:19,430 --> 00:53:17,440

done it in the ground said hey we need

1518

00:53:21,910 --> 00:53:19,440

you to do this and and we could tell

1519

00:53:24,069 --> 00:53:21,920

that that might be a frustrating uh item

1520

00:53:26,710 --> 00:53:24,079

for for each other that we would say

1521

00:53:29,190 --> 00:53:26,720

over the over the intercom or if we were

1522

00:53:31,190 --> 00:53:29,200

floating by we would just say this is

1523

00:53:32,950 --> 00:53:31,200

the mission you know we're both military

1524

00:53:35,349 --> 00:53:32,960

officers also and sometimes you just got

1525

00:53:37,109 --> 00:53:35,359

to follow orders and salute and carry on

1526

00:53:39,910 --> 00:53:37,119

and so we would say to each other this

1527

00:53:42,309 --> 00:53:39,920

is the mission and over time because the

1528

00:53:44,950 --> 00:53:42,319

the tv show the mandalorian was out and

1529

00:53:47,670 --> 00:53:44,960

they in that they say uh this is the way

1530

00:53:48,870 --> 00:53:47,680

this is the way and so we adapted it uh

1531

00:53:50,950 --> 00:53:48,880

because we loved watching the

1532

00:53:53,109 --> 00:53:50,960

mandalorian we took a baby yoda to space

1533

00:53:55,349 --> 00:53:53,119

as our zero g indicator and so we

1534

00:53:57,750 --> 00:53:55,359

started saying this is the way and we

1535

00:54:00,470 --> 00:53:57,760

actually used that one all the time and

1536

00:54:02,230 --> 00:54:00,480

it was mostly uh in humor it was mostly

1537

00:54:03,990 --> 00:54:02,240

a joke you know we'd hear something come

1538

00:54:05,510 --> 00:54:04,000

up from the ground and we'd be in a

1539

00:54:07,430 --> 00:54:05,520

completely different module and one of

1540

00:54:09,750 --> 00:54:07,440

us would yell this is the way you know

1541

00:54:11,750 --> 00:54:09,760

and everybody would laugh uh because we

1542

00:54:14,549 --> 00:54:11,760

understood what was going on

1543

00:54:17,510 --> 00:54:14,559

but the the other one the taking a knee

1544

00:54:19,510 --> 00:54:17,520

we never had to use that in space but i

1545

00:54:21,589 --> 00:54:19,520

think it's important that we had to come

1546

00:54:24,710 --> 00:54:21,599

up with that and i think because we put

1547

00:54:27,349 --> 00:54:24,720

the time to develop a system to hold

1548

00:54:29,349 --> 00:54:27,359

each other accountable but also to build

1549

00:54:31,349 --> 00:54:29,359

trust to use that system of

1550

00:54:32,790 --> 00:54:31,359

accountability i think that's one of the

1551
00:54:34,230 --> 00:54:32,800
reasons that we never actually had to

1552
00:54:36,630 --> 00:54:34,240
use it and that's a good thing i think

1553
00:54:39,430 --> 00:54:36,640
that's a win and so overall though it's

1554
00:54:41,750 --> 00:54:39,440
important to to intentionally take time

1555
00:54:43,829 --> 00:54:41,760
to do self-care and team care training

1556
00:54:45,910 --> 00:54:43,839
and then to have the time dedicated to

1557
00:54:47,990 --> 00:54:45,920
doing it and sometimes we're going to

1558
00:54:49,349 --> 00:54:48,000
have to do it in in real time we're

1559
00:54:51,510 --> 00:54:49,359
getting ready to launch a private

1560
00:54:53,349 --> 00:54:51,520
mission to the space station and as we

1561
00:54:55,030 --> 00:54:53,359
do that we're going to have less time to

1562
00:54:57,030 --> 00:54:55,040
be together on the ground and i think

1563
00:54:58,630 --> 00:54:57,040

it's important for us to consider

1564

00:55:01,349 --> 00:54:58,640

time on the space station that we

1565

00:55:04,309 --> 00:55:01,359

dedicate solely to building

1566

00:55:06,470 --> 00:55:04,319

team camaraderie and morale

1567

00:55:08,150 --> 00:55:06,480

so that those folks can be effective as

1568

00:55:09,270 --> 00:55:08,160

effective as they can be in space

1569

00:55:12,470 --> 00:55:09,280

because it again it requires

1570

00:55:13,990 --> 00:55:12,480

intentionality and it requires time

1571

00:55:16,950 --> 00:55:14,000

that makes total sense

1572

00:55:18,789 --> 00:55:16,960

excellent

1573

00:55:20,710 --> 00:55:18,799

now also just going on the journey six

1574

00:55:22,870 --> 00:55:20,720

and a half hours

1575

00:55:24,390 --> 00:55:22,880

to the space station

1576

00:55:26,950 --> 00:55:24,400

what was that like that's six and a half

1577

00:55:28,470 --> 00:55:26,960

hours of you at a certain point

1578

00:55:30,470 --> 00:55:28,480

you've had the g you've had the ride

1579

00:55:32,549 --> 00:55:30,480

into space and now you're just did you

1580

00:55:34,150 --> 00:55:32,559

feel like okay i'm

1581

00:55:35,109 --> 00:55:34,160

i'm ready to get there let's you know

1582

00:55:39,349 --> 00:55:35,119

what was going through your mind

1583

00:55:43,829 --> 00:55:41,670

so you know it can be uh

1584

00:55:46,309 --> 00:55:43,839

it can be as short as about six and a

1585

00:55:48,789 --> 00:55:46,319

half hours or it can be much longer

1586

00:55:52,069 --> 00:55:48,799

sometimes it can take up to two days in

1587

00:55:55,030 --> 00:55:52,079

the soyuz it used to take 48 hours

1588

00:55:57,589 --> 00:55:55,040

they can get there as short as six hours

1589

00:56:01,109 --> 00:55:57,599

and so our rendezvous actually was in

1590

00:56:03,349 --> 00:56:01,119

between it was 27 hours and so after the

1591

00:56:04,549 --> 00:56:03,359

exhilarating ride of about nine minutes

1592

00:56:05,430 --> 00:56:04,559

into orbit

1593

00:56:07,910 --> 00:56:05,440

um

1594

00:56:10,150 --> 00:56:07,920

we had over a day before we could dock

1595

00:56:12,549 --> 00:56:10,160

with the space station and you know it

1596

00:56:15,270 --> 00:56:12,559

was that's when i had my first view of

1597

00:56:18,069 --> 00:56:15,280

earth from space i had my first meal

1598

00:56:19,750 --> 00:56:18,079

macadamia nuts and cold tomato soup and

1599

00:56:22,390 --> 00:56:19,760

the first time i got to use the bathroom

1600

00:56:23,910 --> 00:56:22,400

in space and so it was fun but after

1601
00:56:25,670 --> 00:56:23,920
trying to go to sleep that's when i

1602
00:56:27,190 --> 00:56:25,680
realized okay i'm ready to be on the

1603
00:56:29,430 --> 00:56:27,200
space station because i slept in my

1604
00:56:31,349 --> 00:56:29,440
chair so i could see the displays if

1605
00:56:32,870 --> 00:56:31,359
something happened i would be right

1606
00:56:34,870 --> 00:56:32,880
there at my workstation ready to you

1607
00:56:37,030 --> 00:56:34,880
know get back to piloting crew dragon

1608
00:56:39,109 --> 00:56:37,040
resilience and so you actually don't

1609
00:56:40,549 --> 00:56:39,119
sleep well in the spacecraft you really

1610
00:56:42,950 --> 00:56:40,559
nap it's really

1611
00:56:44,390 --> 00:56:42,960
snacking instead of having a meal and

1612
00:56:46,630 --> 00:56:44,400
napping instead of getting a good

1613
00:56:49,430 --> 00:56:46,640

night's sleep and so after just taking

1614

00:56:51,109 --> 00:56:49,440

naps over a day when i got to the space

1615

00:56:52,549 --> 00:56:51,119

station i knew that that was where i was

1616

00:56:54,630 --> 00:56:52,559

going to get my first good sleep so i

1617

00:56:57,109 --> 00:56:54,640

was ready

1618

00:56:59,030 --> 00:56:57,119

it's very cool that's very cool now you

1619

00:57:01,750 --> 00:56:59,040

are also you're the first crew that

1620

00:57:05,349 --> 00:57:01,760

landed at night since 1968 since lovell

1621

00:57:06,789 --> 00:57:05,359

and anderson borman the apollo 8 mission

1622

00:57:08,470 --> 00:57:06,799

now what was that like i mean how

1623

00:57:09,670 --> 00:57:08,480

aggressive was the landing

1624

00:57:11,670 --> 00:57:09,680

what happened immediately after

1625

00:57:12,710 --> 00:57:11,680

splashdown i mean what

1626
00:57:14,390 --> 00:57:12,720
you know

1627
00:57:16,309 --> 00:57:14,400
what was it like coming back six months

1628
00:57:18,789 --> 00:57:16,319
later hitting hitting the water what did

1629
00:57:20,950 --> 00:57:18,799
you feel was it rocking did you feel the

1630
00:57:23,670 --> 00:57:20,960
the impact of the water was it

1631
00:57:25,670 --> 00:57:23,680
did they have some special

1632
00:57:29,349 --> 00:57:25,680
system that that carried you a little

1633
00:57:32,150 --> 00:57:29,359
bit took some of the load in the chair

1634
00:57:34,549 --> 00:57:32,160
so it's uh it is actually a really neat

1635
00:57:36,870 --> 00:57:34,559
uh thing to come back to earth after six

1636
00:57:39,670 --> 00:57:36,880
months you know when we first hit the

1637
00:57:41,750 --> 00:57:39,680
atmosphere we do a deorbit burn which uh

1638
00:57:43,670 --> 00:57:41,760

decelerates the spacecraft so it starts

1639

00:57:46,309 --> 00:57:43,680

to descend and then it hits the

1640

00:57:48,870 --> 00:57:46,319

atmosphere and the drag of the air

1641

00:57:51,750 --> 00:57:48,880

starts to slow it down in fact that drag

1642

00:57:54,789 --> 00:57:51,760

you're going so fast that friction heats

1643

00:57:56,710 --> 00:57:54,799

up and and it ignites the air around the

1644

00:57:59,190 --> 00:57:56,720

vehicle creating a plasma cloud that's

1645

00:58:01,109 --> 00:57:59,200

why you come back to earth in a fireball

1646

00:58:03,030 --> 00:58:01,119

and so that heat shield is doing its job

1647

00:58:05,670 --> 00:58:03,040

but that's also when you start to feel

1648

00:58:07,990 --> 00:58:05,680

your first g again and so as the g on

1649

00:58:10,549 --> 00:58:08,000

the spacecraft builds up you start to

1650

00:58:12,069 --> 00:58:10,559

feel your weight again and that's really

1651
00:58:14,549 --> 00:58:12,079
interesting after being weightless for

1652
00:58:16,549 --> 00:58:14,559
six months that's the first sensation

1653
00:58:21,030 --> 00:58:16,559
then when we got to about

1654
00:58:22,870 --> 00:58:21,040
uh 18 000 feet uh the drogue parachutes

1655
00:58:25,750 --> 00:58:22,880
come out and so the g has been coming up

1656
00:58:27,190 --> 00:58:25,760
and so just like on launch the g is into

1657
00:58:29,270 --> 00:58:27,200
your chest because now we turn the

1658
00:58:31,510 --> 00:58:29,280
spacecraft backwards to put the heat

1659
00:58:33,589 --> 00:58:31,520
shield into the wind so the pressure is

1660
00:58:36,069 --> 00:58:33,599
still going into the chest making it

1661
00:58:39,190 --> 00:58:36,079
hard to breathe you feel like your face

1662
00:58:42,309 --> 00:58:39,200
is doing this being stretched out and so

1663
00:58:45,430 --> 00:58:42,319

you get to 18 000 feet and then the

1664

00:58:48,630 --> 00:58:45,440

drogue parachutes come out and that is

1665

00:58:50,710 --> 00:58:48,640

very visceral the vehicle moves and you

1666

00:58:52,309 --> 00:58:50,720

feel it swaying we call that a dutch

1667

00:58:54,390 --> 00:58:52,319

roll it's like rolling and pitching and

1668

00:58:56,309 --> 00:58:54,400

yawing all at the same time and then it

1669

00:58:58,470 --> 00:58:56,319

stabilizes and those drug shoots start

1670

00:59:00,870 --> 00:58:58,480

to slow you down and get you into the

1671

00:59:02,950 --> 00:59:00,880

envelope where the main parachutes come

1672

00:59:05,589 --> 00:59:02,960

out and then those big parachutes come

1673

00:59:08,230 --> 00:59:05,599

out and they they reef they start off

1674

00:59:09,990 --> 00:59:08,240

very uh closed and then they open

1675

00:59:12,309 --> 00:59:10,000

slightly and then open all the way over

1676

00:59:13,990 --> 00:59:12,319

time and so you can actually feel that

1677

00:59:16,150 --> 00:59:14,000

it's almost like hanging on the end of a

1678

00:59:18,309 --> 00:59:16,160

bungee cord when they first come out it

1679

00:59:20,470 --> 00:59:18,319

jerks the vehicle and you kind of bounce

1680

00:59:22,230 --> 00:59:20,480

you almost feel like you're going over a

1681

00:59:24,549 --> 00:59:22,240

bump in a car i felt a little bit of a

1682

00:59:26,950 --> 00:59:24,559

light sensation after feeling the first

1683

00:59:29,589 --> 00:59:26,960

g then i to feel weightless again was

1684

00:59:31,190 --> 00:59:29,599

very interesting and then they widen out

1685

00:59:32,710 --> 00:59:31,200

and slow you down again and so you feel

1686

00:59:35,670 --> 00:59:32,720

again the same

1687

00:59:37,910 --> 00:59:35,680

jerking sensation and then uh from about

1688

00:59:39,990 --> 00:59:37,920

six thousand feet down to the surface

1689

00:59:43,030 --> 00:59:40,000

you're riding under these big four

1690

00:59:45,670 --> 00:59:43,040

parachutes and we were

1691

00:59:47,829 --> 00:59:45,680

uh you touched down doing about 27 feet

1692

00:59:50,309 --> 00:59:47,839

per second if you skydive you know most

1693

00:59:53,109 --> 00:59:50,319

parachutes get you between 20 and 30

1694

00:59:55,030 --> 00:59:53,119

feet per second or seven uh meters per

1695

00:59:57,190 --> 00:59:55,040

second when you touch down and that's

1696

00:59:58,390 --> 00:59:57,200

about what what sport parachutes bring

1697

01:00:00,470 --> 00:59:58,400

you down to the ground at so that's

1698

01:00:02,390 --> 01:00:00,480

about the same velocity that we hit the

1699

01:00:04,710 --> 01:00:02,400

water with and you know the water is a

1700

01:00:06,710 --> 01:00:04,720

nicer place to touch down than the land

1701
01:00:08,789 --> 01:00:06,720
and so the the touchdown was actually

1702
01:00:10,309 --> 01:00:08,799
quite soft because it gives the the

1703
01:00:12,069 --> 01:00:10,319
spacecraft settles into the water a

1704
01:00:14,789 --> 01:00:12,079
little bit and then rebounds and then

1705
01:00:17,349 --> 01:00:14,799
bounces and because it was night and the

1706
01:00:19,109 --> 01:00:17,359
seas were nice and calm it felt like we

1707
01:00:21,430 --> 01:00:19,119
were just gently rocking you couldn't

1708
01:00:24,230 --> 01:00:21,440
see the horizon outside so there wasn't

1709
01:00:26,390 --> 01:00:24,240
a sense of you know disorientation which

1710
01:00:27,910 --> 01:00:26,400
i was very worried about it felt nice

1711
01:00:29,750 --> 01:00:27,920
and calm like i was sitting in a rocking

1712
01:00:31,430 --> 01:00:29,760
chair just going back and forth and it

1713
01:00:32,470 --> 01:00:31,440

actually felt very good it felt very

1714

01:00:35,430 --> 01:00:32,480

comforting

1715

01:00:38,390 --> 01:00:35,440

however it was at that time i'm now back

1716

01:00:41,109 --> 01:00:38,400

in 1g i feel my 200 pounds and that's

1717

01:00:42,710 --> 01:00:41,119

when i noticed i had to pee i could also

1718

01:00:44,390 --> 01:00:42,720

feel the weight of my bladder for the

1719

01:00:46,710 --> 01:00:44,400

first time and it was a really

1720

01:00:48,309 --> 01:00:46,720

interesting sensation after not having

1721

01:00:49,270 --> 01:00:48,319

it for six months

1722

01:00:50,870 --> 01:00:49,280

wow

1723

01:00:52,710 --> 01:00:50,880

for six months you did not have that

1724

01:00:54,309 --> 01:00:52,720

feeling at all

1725

01:00:55,829 --> 01:00:54,319

well not the weight you know it's really

1726

01:00:57,829 --> 01:00:55,839

interesting because you have to really

1727

01:00:59,750 --> 01:00:57,839

go regularly and encourage yourself to

1728

01:01:01,349 --> 01:00:59,760

go because by the time you feel that it

1729

01:01:02,710 --> 01:01:01,359

means your bladder is really full

1730

01:01:04,789 --> 01:01:02,720

because you don't have the weight it

1731

01:01:07,109 --> 01:01:04,799

means it you know volume wise has filled

1732

01:01:09,870 --> 01:01:07,119

up so yeah to feel the weight again now

1733

01:01:11,910 --> 01:01:09,880

it was like whoa i've got to go now

1734

01:01:13,990 --> 01:01:11,920

[Laughter]

1735

01:01:15,670 --> 01:01:14,000

and what about your strength

1736

01:01:17,589 --> 01:01:15,680

or otherwise when you when you got up

1737

01:01:19,030 --> 01:01:17,599

and started walking again what was that

1738

01:01:21,190 --> 01:01:19,040

like

1739

01:01:22,950 --> 01:01:21,200

yes so you have a recovery crew that

1740

01:01:24,230 --> 01:01:22,960

gets you out of the seat takes you out

1741

01:01:26,309 --> 01:01:24,240

the hatch and gets you to the edge of

1742

01:01:28,630 --> 01:01:26,319

the vehicle once we were up on the boat

1743

01:01:30,789 --> 01:01:28,640

right and uh and so we're still on the

1744

01:01:32,870 --> 01:01:30,799

ocean you know on the recovery ship and

1745

01:01:35,030 --> 01:01:32,880

things are swaying and now like i said

1746

01:01:37,910 --> 01:01:35,040

i've been working out eating well in

1747

01:01:38,789 --> 01:01:37,920

space and i felt strong i felt really

1748

01:01:41,270 --> 01:01:38,799

strong

1749

01:01:43,670 --> 01:01:41,280

and we get up and i've got two people

1750

01:01:46,069 --> 01:01:43,680

helping me and they i get up and i feel

1751
01:01:48,710 --> 01:01:46,079
strong standing up i can easily lift my

1752
01:01:51,430 --> 01:01:48,720
weight but then that motion it

1753
01:01:53,829 --> 01:01:51,440
rocks one way and my head almost hit the

1754
01:01:55,670 --> 01:01:53,839
person on my left i mean my head felt so

1755
01:01:58,390 --> 01:01:55,680
heavy and then it goes back the other

1756
01:01:59,829 --> 01:01:58,400
way and my head feels so heavy and i was

1757
01:02:01,910 --> 01:01:59,839
really grateful that i had people

1758
01:02:03,670 --> 01:02:01,920
helping me because had that rocking

1759
01:02:06,069 --> 01:02:03,680
motion happen and i was standing up by

1760
01:02:09,109 --> 01:02:06,079
myself i would have tumbled over to the

1761
01:02:11,430 --> 01:02:09,119
ground i felt really strong but i had no

1762
01:02:13,109 --> 01:02:11,440
sense of balance i was a 45 year old

1763
01:02:15,670 --> 01:02:13,119

toddler it was really interesting

1764

01:02:18,150 --> 01:02:15,680

because i know how to walk it's in there

1765

01:02:20,950 --> 01:02:18,160

the memories there but it was really

1766

01:02:23,109 --> 01:02:20,960

difficult to to ambulate i could stand

1767

01:02:25,029 --> 01:02:23,119

up but i could not resist the rocking

1768

01:02:26,789 --> 01:02:25,039

motion of the ship

1769

01:02:28,950 --> 01:02:26,799

how long did it take for you to recover

1770

01:02:31,109 --> 01:02:28,960

that

1771

01:02:32,789 --> 01:02:31,119

interesting question so i yeah i wrote

1772

01:02:34,470 --> 01:02:32,799

it down in my journal because it was

1773

01:02:36,950 --> 01:02:34,480

interesting every hour

1774

01:02:38,870 --> 01:02:36,960

i got a little more capability back it

1775

01:02:41,109 --> 01:02:38,880

became a little more comfortable and it

1776

01:02:43,190 --> 01:02:41,119

was about the four-hour point we had

1777

01:02:45,910 --> 01:02:43,200

flown a helicopter off the ship to

1778

01:02:48,309 --> 01:02:45,920

pensacola and at navy pensacola we had

1779

01:02:50,710 --> 01:02:48,319

to go through a series of tests to sit

1780

01:02:52,470 --> 01:02:50,720

down stand up lie down and stand up to

1781

01:02:54,069 --> 01:02:52,480

check orthostatic intolerance to make

1782

01:02:55,990 --> 01:02:54,079

sure our heart was pumping sufficient

1783

01:02:58,710 --> 01:02:56,000

blood to our brain to keep us conscious

1784

01:03:01,029 --> 01:02:58,720

and so doing that test was is when i

1785

01:03:02,870 --> 01:03:01,039

realized okay this is the point where i

1786

01:03:04,710 --> 01:03:02,880

would be comfortable uh you know

1787

01:03:07,510 --> 01:03:04,720

building a habitat on mars or on the

1788

01:03:09,349 --> 01:03:07,520

moon and so if you fly to mars it's

1789

01:03:11,510 --> 01:03:09,359

going to take you six to nine months i

1790

01:03:12,870 --> 01:03:11,520

was on the iss for six to nine months

1791

01:03:17,029 --> 01:03:12,880

you're gonna get to mars and you're

1792

01:03:18,710 --> 01:03:17,039

gonna be in you know about um a third of

1793

01:03:20,309 --> 01:03:18,720

gravity of earth so that's going to be

1794

01:03:23,109 --> 01:03:20,319

different but you're going to be back in

1795

01:03:25,589 --> 01:03:23,119

some sense of weight uh and it's going

1796

01:03:27,430 --> 01:03:25,599

to take me about four hours to get to

1797

01:03:30,150 --> 01:03:27,440

the point where i can comfortably move

1798

01:03:32,069 --> 01:03:30,160

around and get myself out of the vehicle

1799

01:03:33,829 --> 01:03:32,079

that's a data point that i very much

1800

01:03:35,589 --> 01:03:33,839

wanted to know and to keep so i wrote it

1801
01:03:37,990 --> 01:03:35,599
in my journal and those are the kinds of

1802
01:03:40,789 --> 01:03:38,000
things i think we need to extract from

1803
01:03:42,390 --> 01:03:40,799
iss missions as they relate to going on

1804
01:03:44,069 --> 01:03:42,400
you know our artemis program is going to

1805
01:03:45,910 --> 01:03:44,079
get us to the moon to stay and then

1806
01:03:48,069 --> 01:03:45,920
eventually on to mars and we need to

1807
01:03:50,870 --> 01:03:48,079
start capturing all of those lessons

1808
01:03:53,029 --> 01:03:50,880
about how our bodies are affected

1809
01:03:54,789 --> 01:03:53,039
were your fellow astronauts was at the

1810
01:03:57,270 --> 01:03:54,799
same time period for them

1811
01:03:59,430 --> 01:03:57,280
those four hours uh just observing you

1812
01:04:01,589 --> 01:03:59,440
know i just see them doing their

1813
01:04:03,349 --> 01:04:01,599

yeah i think it was about the same maybe

1814

01:04:05,510 --> 01:04:03,359

some a little sooner maybe some a little

1815

01:04:07,430 --> 01:04:05,520

slower but i think about that time we

1816

01:04:09,430 --> 01:04:07,440

were all feeling good and then a few

1817

01:04:11,589 --> 01:04:09,440

hours after that we flew from pensacola

1818

01:04:13,270 --> 01:04:11,599

back to houston and our families were

1819

01:04:15,190 --> 01:04:13,280

there to meet us at the airfield and

1820

01:04:18,150 --> 01:04:15,200

each one of us was able to walk down the

1821

01:04:20,630 --> 01:04:18,160

stairs of the plane and walk to our vans

1822

01:04:22,630 --> 01:04:20,640

uh to then go back to the crew quarters

1823

01:04:25,029 --> 01:04:22,640

the quarantine facility and so i think

1824

01:04:26,390 --> 01:04:25,039

all of us were about on that same uh

1825

01:04:28,710 --> 01:04:26,400

recovery pace

1826
01:04:30,710 --> 01:04:28,720
so how long before you felt you feel you

1827
01:04:32,950 --> 01:04:30,720
could fly an airplane or

1828
01:04:34,789 --> 01:04:32,960
you know uh drive a car

1829
01:04:37,109 --> 01:04:34,799
ride a motorcycle on a race track how

1830
01:04:39,349 --> 01:04:37,119
long for that

1831
01:04:41,270 --> 01:04:39,359
so the doctors evaluate us for about two

1832
01:04:42,950 --> 01:04:41,280
weeks and they generally won't let you

1833
01:04:45,430 --> 01:04:42,960
even if you tell them doc i feel great

1834
01:04:47,109 --> 01:04:45,440
they they make you wait two weeks and so

1835
01:04:49,349 --> 01:04:47,119
at about two weeks i felt like i could

1836
01:04:50,950 --> 01:04:49,359
have driven a car i probably would have

1837
01:04:53,190 --> 01:04:50,960
waited a little bit i did i waited a

1838
01:04:55,349 --> 01:04:53,200

little longer before flying actually i

1839

01:04:57,670 --> 01:04:55,359

waited even before driving they let me

1840

01:04:59,829 --> 01:04:57,680

have a driver for three weeks and so i

1841

01:05:01,990 --> 01:04:59,839

took advantage and just kept the driver

1842

01:05:04,549 --> 01:05:02,000

for three weeks and i started driving at

1843

01:05:06,230 --> 01:05:04,559

three weeks i felt great and so it was

1844

01:05:09,750 --> 01:05:06,240

about a month after that i started

1845

01:05:12,150 --> 01:05:09,760

flying again and i'm glad i i got back

1846

01:05:14,230 --> 01:05:12,160

into flying early but i didn't go too

1847

01:05:15,990 --> 01:05:14,240

early i didn't want to have to worry

1848

01:05:18,069 --> 01:05:16,000

flying is already hard enough and takes

1849

01:05:20,150 --> 01:05:18,079

enough focus and attention uh that i

1850

01:05:22,390 --> 01:05:20,160

didn't want to add onto that now

1851

01:05:24,150 --> 01:05:22,400

worrying if my ability

1852

01:05:26,069 --> 01:05:24,160

uh just because i'd returned to earth

1853

01:05:28,390 --> 01:05:26,079

was was going to be there so i wanted to

1854

01:05:29,829 --> 01:05:28,400

wait until i i knew that i i was i was

1855

01:05:32,390 --> 01:05:29,839

ready

1856

01:05:33,990 --> 01:05:32,400

that's also another interesting thing to

1857

01:05:35,990 --> 01:05:34,000

keep in mind in terms of when you land

1858

01:05:39,029 --> 01:05:36,000

on mars or the moon if you're operating

1859

01:05:41,270 --> 01:05:39,039

machinery how long that period from will

1860

01:05:43,670 --> 01:05:41,280

it take to get there that zero g

1861

01:05:45,910 --> 01:05:43,680

to then before you're able to start

1862

01:05:48,230 --> 01:05:45,920

handling different kinds of machinery or

1863

01:05:50,470 --> 01:05:48,240

you know how how ambulatory can you be

1864

01:05:52,710 --> 01:05:50,480

what kind of stress can the body and not

1865

01:05:55,190 --> 01:05:52,720

just physically but mentally can you can

1866

01:05:58,150 --> 01:05:55,200

you handle once you get there

1867

01:06:00,470 --> 01:05:58,160

right and then and i had a special team

1868

01:06:02,630 --> 01:06:00,480

my those acers that i keep bringing up

1869

01:06:05,109 --> 01:06:02,640

such an amazing group of folks that i

1870

01:06:07,349 --> 01:06:05,119

had dedicated two hours every day

1871

01:06:09,270 --> 01:06:07,359

working on strength balance we were

1872

01:06:11,510 --> 01:06:09,280

doing toe touches and bending down to

1873

01:06:13,829 --> 01:06:11,520

the ground standing on one leg you know

1874

01:06:16,230 --> 01:06:13,839

standing on the the bosu balls to work

1875

01:06:18,870 --> 01:06:16,240

balance i had a professional working

1876

01:06:20,150 --> 01:06:18,880

with me every day for two hours seven

1877

01:06:22,470 --> 01:06:20,160

days a week

1878

01:06:25,190 --> 01:06:22,480

to help get me back and we did that for

1879

01:06:27,029 --> 01:06:25,200

45 days so again you're right that is

1880

01:06:30,230 --> 01:06:27,039

absolutely the kinds of things that we

1881

01:06:31,670 --> 01:06:30,240

need to know so that crew members can do

1882

01:06:33,430 --> 01:06:31,680

those things for themselves because

1883

01:06:35,270 --> 01:06:33,440

you're not going to have you know this

1884

01:06:37,109 --> 01:06:35,280

amazing training team with you there on

1885

01:06:39,029 --> 01:06:37,119

mars you're going to have to know what

1886

01:06:40,789 --> 01:06:39,039

what works and what doesn't work and

1887

01:06:42,549 --> 01:06:40,799

you're also going to have to know

1888

01:06:44,069 --> 01:06:42,559

i'm not going to drive a forklift right

1889

01:06:45,510 --> 01:06:44,079

now because i would be a danger to

1890

01:06:47,510 --> 01:06:45,520

myself and my crewmates and that

1891

01:06:49,670 --> 01:06:47,520

forklift so it's going to take me

1892

01:06:51,349 --> 01:06:49,680

probably 45 days before i'm going to do

1893

01:06:54,710 --> 01:06:51,359

the really high value

1894

01:06:56,069 --> 01:06:54,720

high risk operations

1895

01:06:58,069 --> 01:06:56,079

well that's really interesting now

1896

01:07:00,230 --> 01:06:58,079

victor i could talk to you

1897

01:07:02,630 --> 01:07:00,240

i could stay here all day and we have a

1898

01:07:05,430 --> 01:07:02,640

worldwide audience extreme mentors

1899

01:07:07,190 --> 01:07:05,440

listening listening to you you know and

1900

01:07:09,029 --> 01:07:07,200

they want to use a medical training as a

1901

01:07:11,270 --> 01:07:09,039

powerful force for good pushing the

1902

01:07:13,109 --> 01:07:11,280

boundaries of extreme medicine now is

1903

01:07:16,630 --> 01:07:13,119

there anything that you would like to

1904

01:07:18,870 --> 01:07:16,640

say to them now give them a a message

1905

01:07:20,549 --> 01:07:18,880

before we close absolutely

1906

01:07:21,990 --> 01:07:20,559

yes thank you and thank you for this

1907

01:07:24,150 --> 01:07:22,000

opportunity

1908

01:07:25,190 --> 01:07:24,160

that's what i want to say is thank you

1909

01:07:30,470 --> 01:07:25,200

thank you

1910

01:07:33,029 --> 01:07:30,480

is still you know experiencing this

1911

01:07:35,990 --> 01:07:33,039

pandemic i think all of us have health

1912

01:07:38,549 --> 01:07:36,000

care workers uh and professionals and

1913

01:07:40,789 --> 01:07:38,559

and janitorial workers and professionals

1914

01:07:43,190 --> 01:07:40,799

on our minds all the time

1915

01:07:45,829 --> 01:07:43,200

and and then you add something to that

1916

01:07:47,589 --> 01:07:45,839

you know in church it really impacted me

1917

01:07:50,710 --> 01:07:47,599

when i was young and i heard someone say

1918

01:07:53,190 --> 01:07:50,720

to me you have to meet people where they

1919

01:07:54,470 --> 01:07:53,200

are you have to take your gifts to

1920

01:07:56,870 --> 01:07:54,480

people you have to meet people where

1921

01:07:59,829 --> 01:07:56,880

they are and i think of the the the

1922

01:08:01,510 --> 01:07:59,839

extreme medical community as not only

1923

01:08:03,990 --> 01:08:01,520

this this great group of folks that

1924

01:08:06,309 --> 01:08:04,000

provide health care but you do it in

1925

01:08:09,270 --> 01:08:06,319

isolated confined extreme and hostile

1926

01:08:11,990 --> 01:08:09,280

sometimes environments you take this

1927

01:08:14,390 --> 01:08:12,000

life-saving care and meet people where

1928

01:08:18,709 --> 01:08:14,400

they are and and so i just want to

1929

01:08:21,669 --> 01:08:18,719

express my gratitude and my my awes that

1930

01:08:23,910 --> 01:08:21,679

that you are able to do things that most

1931

01:08:25,990 --> 01:08:23,920

people can't even do so that you can

1932

01:08:28,870 --> 01:08:26,000

provide health care to people in these

1933

01:08:31,269 --> 01:08:28,880

extreme uh circumstances thank you i

1934

01:08:33,110 --> 01:08:31,279

think what you do is commendable and i

1935

01:08:35,910 --> 01:08:33,120

look up to you and and and i really want

1936

01:08:39,269 --> 01:08:35,920

to be like you i hope to engage in more

1937

01:08:41,510 --> 01:08:39,279

uh training for uh extreme environments

1938

01:08:43,990 --> 01:08:41,520

uh and you know they say imitation is

1939

01:08:46,149 --> 01:08:44,000

the greatest form of flattery and and i

1940

01:08:49,030 --> 01:08:46,159

desire to be very much like you all

1941

01:08:50,789 --> 01:08:49,040

thank you for your service

1942

01:08:53,110 --> 01:08:50,799

that was excellent i i agree with you

1943

01:08:54,870 --> 01:08:53,120

victor you are impressive and what

1944

01:08:56,550 --> 01:08:54,880

you've accomplished thus far is

1945

01:08:59,910 --> 01:08:56,560

absolutely impressive absolutely

1946

01:09:01,669 --> 01:08:59,920

engaging incredibly informative and i'm

1947

01:09:02,870 --> 01:09:01,679

grateful to be here and i'm grateful

1948

01:09:04,630 --> 01:09:02,880

also to

1949

01:09:06,630 --> 01:09:04,640

all all these people out there that are

1950

01:09:07,749 --> 01:09:06,640

helping people and just want to thank

1951

01:09:13,590 --> 01:09:07,759

you

1952

01:09:15,910 --> 01:09:13,600

yes sir yes please and it's because it's

1953

01:09:18,390 --> 01:09:15,920

so amazing to talk to you oh i'm ready

1954

01:09:21,110 --> 01:09:18,400

to go and thank you for that

1955

01:09:22,870 --> 01:09:21,120

i showed up i showed up here today and

1956

01:09:24,709 --> 01:09:22,880

you know i saw this on the calendar and

1957

01:09:26,870 --> 01:09:24,719

i read the papers and stuff but i still

1958

01:09:28,789 --> 01:09:26,880

asked my my public affairs team this

1959

01:09:30,870 --> 01:09:28,799

awesome group of pros and i said hey

1960

01:09:33,430 --> 01:09:30,880

guys i just want to get this straight so

1961

01:09:36,229 --> 01:09:33,440

tom cruise is going to ask me questions

1962

01:09:39,189 --> 01:09:36,239

today i just i just figured there was a

1963

01:09:42,070 --> 01:09:39,199

typo somewhere so this has truly been a

1964

01:09:44,229 --> 01:09:42,080

treat tom thank you so much for the time

1965

01:09:45,990 --> 01:09:44,239

and i hope you enjoy flying that

1966

01:09:47,990 --> 01:09:46,000

spitfire that is that's going to be

1967

01:09:50,550 --> 01:09:48,000

amazing thank you man you'll we'll

1968

01:09:52,789 --> 01:09:50,560

you'll we'll get you to p51 i enjoyed

1969

01:09:54,630 --> 01:09:52,799

this amazingly incredibly informative i

1970

01:09:57,590 --> 01:09:54,640

just very grateful to have this