



1
00:00:06,230 --> 00:00:02,389
station this is houston are you ready

2
00:00:06,240 --> 00:00:10,549
i'm ready for the event

3
00:00:14,789 --> 00:00:12,470
usa science and engineering festival

4
00:00:18,710 --> 00:00:14,799
this is mission control houston please

5
00:00:22,870 --> 00:00:19,830
hello

6
00:00:24,550 --> 00:00:22,880
mission control this is the usa science

7
00:00:32,549 --> 00:00:24,560
and engineering festival you're loud and

8
00:00:39,430 --> 00:00:36,229
and i've got you loud and clear as well

9
00:00:45,510 --> 00:00:41,670
hey jeff we see you floating up there

10
00:00:46,630 --> 00:00:45,520
right now waving to the crowd all right

11
00:00:48,470 --> 00:00:46,640
so jeff

12
00:00:53,189 --> 00:00:48,480
where are you right at this moment

13
00:00:58,069 --> 00:00:55,270

we're just heading up over the atlantic

14

00:01:00,790 --> 00:00:58,079

uh toward europe we just passed south of

15

00:01:03,110 --> 00:01:00,800

the bahamas prior to that right over the

16

00:01:05,189 --> 00:01:03,120

panama canal i was out trying to get a

17

00:01:06,870 --> 00:01:05,199

picture of the panama canal but as usual

18

00:01:09,030 --> 00:01:06,880

it was it was

19

00:01:11,510 --> 00:01:09,040

pretty cloudy but the bahamas look

20

00:01:13,910 --> 00:01:11,520

beautiful as always

21

00:01:15,990 --> 00:01:13,920

okay all right so we we got a little bit

22

00:01:17,990 --> 00:01:16,000

of misinformation we thought that you

23

00:01:19,350 --> 00:01:18,000

had been there about 10 or 15 minutes

24

00:01:25,590 --> 00:01:19,360

ago and that you're further along is

25

00:01:30,950 --> 00:01:29,190

uh well we crossed panama about uh 10

26
00:01:34,069 --> 00:01:30,960
minutes ago yes and now we're heading

27
00:01:36,390 --> 00:01:34,079
over the atlantic ocean toward europe

28
00:01:42,469 --> 00:01:36,400
got it all right that's great and you're

29
00:01:44,950 --> 00:01:43,749
that's right

30
00:01:47,749 --> 00:01:44,960
17

31
00:01:50,630 --> 00:01:47,759
500 miles an hour 90 minutes around the

32
00:01:53,429 --> 00:01:50,640
earth 16 times a day we go around the

33
00:01:54,870 --> 00:01:53,439
earth what does it feel like

34
00:01:57,030 --> 00:01:54,880
okay now

35
00:01:59,350 --> 00:01:57,040
there's a delay in the communication so

36
00:02:01,990 --> 00:01:59,360
all right so jeff i want to introduce

37
00:02:04,469 --> 00:02:02,000
you to two nickelodeon stars

38
00:02:06,950 --> 00:02:04,479

cree and madison and they're going to

39

00:02:08,070 --> 00:02:06,960

take over the questions and so i'm

40

00:02:11,190 --> 00:02:08,080

letting them know there's a little bit

41

00:02:13,670 --> 00:02:11,200

of a delay so we'll pause after we after

42

00:02:20,229 --> 00:02:13,680

we speak so first question

43

00:02:24,710 --> 00:02:22,470

oh of course what i miss the most is my

44

00:02:26,869 --> 00:02:24,720

family uh being away from my wife and my

45

00:02:30,550 --> 00:02:26,879

kids and my daughters-in-law and my

46

00:02:32,390 --> 00:02:30,560

grandkids that's what i miss the most

47

00:02:38,309 --> 00:02:32,400

all right next question what have you

48

00:02:42,710 --> 00:02:40,869

today was mostly a day off however i

49

00:02:44,869 --> 00:02:42,720

have been working on an experiment where

50

00:02:47,430 --> 00:02:44,879

we're studying the the effects of

51
00:02:50,550 --> 00:02:47,440
weightlessness on it's a biology

52
00:02:52,550 --> 00:02:50,560
experiment growing nematodes and putting

53
00:02:54,070 --> 00:02:52,560
them under an experiment it's a japanese

54
00:02:55,190 --> 00:02:54,080
experiment so i've been working with the

55
00:02:57,430 --> 00:02:55,200
scuba

56
00:02:59,350 --> 00:02:57,440
space center in japan

57
00:03:01,030 --> 00:02:59,360
today and over the last several days

58
00:03:02,790 --> 00:03:01,040
actually

59
00:03:04,790 --> 00:03:02,800
that's awesome

60
00:03:10,070 --> 00:03:04,800
where's your favorite place to hang out

61
00:03:14,550 --> 00:03:12,550
oh that's easy my favorite place to hang

62
00:03:16,550 --> 00:03:14,560
out is in the cupola i call it the

63
00:03:18,630 --> 00:03:16,560

window on the world it's got seven

64

00:03:20,070 --> 00:03:18,640

windows where it's the only place on the

65

00:03:22,470 --> 00:03:20,080

space station where we can see the

66

00:03:25,670 --> 00:03:22,480

entire globe of the earth so it's a

67

00:03:27,030 --> 00:03:25,680

fantastic place to hang out

68

00:03:28,630 --> 00:03:27,040

that's awesome

69

00:03:30,070 --> 00:03:28,640

so today is your day off so what do you

70

00:03:35,910 --> 00:03:30,080

like to do for fun when you're not

71

00:03:40,630 --> 00:03:38,309

well uh the cupola being my favorite

72

00:03:43,030 --> 00:03:40,640

place to hang out i usually go there

73

00:03:45,030 --> 00:03:43,040

with a camera and it's a camera with a

74

00:03:46,710 --> 00:03:45,040

big lens like this so i love to take

75

00:03:49,509 --> 00:03:46,720

pictures of the earth

76

00:03:53,110 --> 00:03:49,519

the earth is a is a beautiful place a

77

00:03:56,710 --> 00:03:53,120

never-ending variety of weather systems

78

00:03:58,149 --> 00:03:56,720

of landforms of ocean currents of

79

00:03:59,750 --> 00:03:58,159

light conditions

80

00:04:03,990 --> 00:03:59,760

so it's a great place to take pictures

81

00:04:12,070 --> 00:04:06,789

okay what's your favorite food to eat in

82

00:04:15,910 --> 00:04:14,070

well i've got lots of favorites up here

83

00:04:17,990 --> 00:04:15,920

i like a lot of different kinds of foods

84

00:04:20,069 --> 00:04:18,000

just like i like on earth of course we

85

00:04:22,230 --> 00:04:20,079

don't get fresh food very often but we

86

00:04:24,629 --> 00:04:22,240

did last week get some fresh fruits and

87

00:04:25,510 --> 00:04:24,639

vegetables and when you haven't had

88

00:04:31,270 --> 00:04:25,520

those

89

00:04:35,189 --> 00:04:33,189

awesome what's your advice for some

90

00:04:41,350 --> 00:04:35,199

students here who have an interest in

91

00:04:45,110 --> 00:04:42,950

well of course you're there because you

92

00:04:47,430 --> 00:04:45,120

have an interest in math and science and

93

00:04:49,670 --> 00:04:47,440

engineering and technology and that's

94

00:04:51,590 --> 00:04:49,680

great if you have an interest

95

00:04:53,510 --> 00:04:51,600

and and that's the what you want to

96

00:04:55,590 --> 00:04:53,520

pursue i would encourage you to work

97

00:04:57,590 --> 00:04:55,600

hard toward that goal

98

00:05:00,230 --> 00:04:57,600

study hard in school

99

00:05:01,990 --> 00:05:00,240

find out what doors open before you and

100

00:05:03,909 --> 00:05:02,000

enter don't be afraid to enter those

101

00:05:05,430 --> 00:05:03,919

doors and when you're shooting for

102

00:05:08,070 --> 00:05:05,440

something when you're when you have a

103

00:05:09,189 --> 00:05:08,080

goal out in front of you and you maybe

104

00:05:11,430 --> 00:05:09,199

fail

105

00:05:14,150 --> 00:05:11,440

on occasion to uh to progress toward

106

00:05:16,629 --> 00:05:14,160

that goal don't give up persevere and

107

00:05:19,670 --> 00:05:16,639

continue to work hard and and go through

108

00:05:22,710 --> 00:05:19,680

those doors that open before you

109

00:05:25,909 --> 00:05:22,720

all right so as you know we're here at

110

00:05:28,070 --> 00:05:25,919

the usa science and engineering festival

111

00:05:30,870 --> 00:05:28,080

with hundreds of thousands of students

112

00:05:33,029 --> 00:05:30,880

who are interested in stem okay so from

113

00:05:37,510 --> 00:05:33,039

your perspective why is stem so

114

00:05:43,110 --> 00:05:39,510

oh wow well if you look at the history

115

00:05:45,110 --> 00:05:43,120

of civilization it really uh history

116

00:05:45,990 --> 00:05:45,120

civilization really blossomed really

117

00:05:48,230 --> 00:05:46,000

grew

118

00:05:50,870 --> 00:05:48,240

with the advent of

119

00:05:53,110 --> 00:05:50,880

uh science and exploration it's called

120

00:05:55,590 --> 00:05:53,120

the age of discovery and it's really

121

00:05:57,909 --> 00:05:55,600

because uh the the earth is so

122

00:06:00,870 --> 00:05:57,919

observable and we can extract things

123

00:06:03,110 --> 00:06:00,880

from the earth that we're able to use

124

00:06:05,749 --> 00:06:03,120

science and technology

125

00:06:08,550 --> 00:06:05,759

and develop it for the good of humankind

126

00:06:11,909 --> 00:06:08,560

so it has made a huge difference uh in

127

00:06:14,150 --> 00:06:11,919

history uh for the people on earth so it

128

00:06:14,950 --> 00:06:14,160

that's why it's so important to continue

129

00:06:17,350 --> 00:06:14,960

that

130

00:06:20,790 --> 00:06:17,360

exploration and discovery out of this

131

00:06:23,110 --> 00:06:20,800

world uh that we see around us

132

00:06:23,909 --> 00:06:23,120

yeah of course hey jeff this is greg

133

00:06:24,870 --> 00:06:23,919

here

134

00:06:26,870 --> 00:06:24,880

um

135

00:06:28,710 --> 00:06:26,880

is it true that you took on on a

136

00:06:31,350 --> 00:06:28,720

previous space flight is it true that

137

00:06:34,629 --> 00:06:31,360

you took a photograph of an erupting

138

00:06:36,390 --> 00:06:34,639

volcano that actually was not known

139

00:06:38,230 --> 00:06:36,400

until the moment that that image was

140

00:06:41,510 --> 00:06:38,240

sent down is that really true tell us

141

00:06:46,309 --> 00:06:44,550

that's right that was in may of 2006 and

142

00:06:48,950 --> 00:06:46,319

uh there were only two of us on board

143

00:06:50,790 --> 00:06:48,960

pavel vinogradov and i and i was back in

144

00:06:52,070 --> 00:06:50,800

the russian segment i took a break went

145

00:06:53,909 --> 00:06:52,080

back and had a convert short

146

00:06:55,110 --> 00:06:53,919

conversation with pablo i think we had a

147

00:06:57,830 --> 00:06:55,120

bag of tea

148

00:06:59,589 --> 00:06:57,840

we drink tea through a straw and i was

149

00:07:01,350 --> 00:06:59,599

coming back up here in the laboratory

150

00:07:03,670 --> 00:07:01,360

module to continue my work i looked out

151
00:07:05,830 --> 00:07:03,680
the window i saw the aleutian islands

152
00:07:07,990 --> 00:07:05,840
off the coast of alaska and i started i

153
00:07:10,390 --> 00:07:08,000
grabbed the camera a camera just like

154
00:07:12,230 --> 00:07:10,400
this and i started taking pictures of it

155
00:07:14,390 --> 00:07:12,240
first one island then the next island

156
00:07:15,909 --> 00:07:14,400
then the next island and all of a sudden

157
00:07:17,749 --> 00:07:15,919
something didn't look right in that last

158
00:07:20,150 --> 00:07:17,759
one and i went back and reframed the

159
00:07:21,909 --> 00:07:20,160
picture and there was a volcano brand

160
00:07:24,230 --> 00:07:21,919
new eruption i could see the entire

161
00:07:26,070 --> 00:07:24,240
plume it had just started

162
00:07:28,870 --> 00:07:26,080
so i was able to take two or three

163
00:07:31,029 --> 00:07:28,880

pictures one orbit later 90 minutes

164

00:07:32,390 --> 00:07:31,039

later i set the alarm on my watch to be

165

00:07:35,589 --> 00:07:32,400

back in the window to take some more

166

00:07:37,589 --> 00:07:35,599

pictures and it was done it had been

167

00:07:39,909 --> 00:07:37,599

the eruption was complete

168

00:07:42,309 --> 00:07:39,919

my guess is it only lasted 20 minutes or

169

00:07:44,150 --> 00:07:42,319

so i had called mission control they

170

00:07:45,830 --> 00:07:44,160

contacted the alaskan volcano

171

00:07:48,230 --> 00:07:45,840

observatory they didn't know about it

172

00:07:51,749 --> 00:07:48,240

yet um so

173

00:07:53,430 --> 00:07:51,759

but they did uh see the data later uh so

174

00:07:55,350 --> 00:07:53,440

they they verified the eruption they

175

00:07:57,909 --> 00:07:55,360

also had some other satellite imagery

176

00:07:59,990 --> 00:07:57,919

that verified the eruption uh to my

177

00:08:01,909 --> 00:08:00,000

knowledge to this date i'm the only one

178

00:08:03,830 --> 00:08:01,919

either on or off the planet that

179

00:08:05,510 --> 00:08:03,840

happened to see that particular eruption

180

00:08:08,150 --> 00:08:05,520

so it was an exciting day for me

181

00:08:11,589 --> 00:08:10,390

that's an awesome story thanks jeff all

182

00:08:13,510 --> 00:08:11,599

right ladies

183

00:08:14,230 --> 00:08:13,520

do you have other questions i

184

00:08:22,309 --> 00:08:14,240

well

185

00:08:27,029 --> 00:08:24,790

oh there's lots of nice things to be in

186

00:08:29,909 --> 00:08:27,039

space i talked about viewing the earth

187

00:08:31,830 --> 00:08:29,919

of course you can play with things

188

00:08:34,389 --> 00:08:31,840

doing things doing experiments in a

189

00:08:36,630 --> 00:08:34,399

weightless environment studying physics

190

00:08:38,949 --> 00:08:36,640

doing physics practical exercises in a

191

00:08:41,829 --> 00:08:38,959

weightless environment is always a lot

192

00:08:44,070 --> 00:08:41,839

of fun all astronauts turn to kids again

193

00:08:46,310 --> 00:08:44,080

we love to play with our food and catch

194

00:08:47,990 --> 00:08:46,320

food in our mouth and whatnot so there's

195

00:08:50,550 --> 00:08:48,000

all kinds of great things to do in a

196

00:08:53,430 --> 00:08:50,560

weightless environment

197

00:08:55,030 --> 00:08:53,440

is that uh is that like a 400 millimeter

198

00:08:56,310 --> 00:08:55,040

lens right there is that what that that

199

00:09:07,910 --> 00:08:56,320

is

200

00:09:10,230 --> 00:09:07,920

here's an 800 millimeter lens with a

201
00:09:12,230 --> 00:09:10,240
doubler on it it's bigger than the one

202
00:09:15,670 --> 00:09:12,240
uh that what you know of when you were

203
00:09:17,430 --> 00:09:15,680
up here uh greg um but we've got a whole

204
00:09:19,350 --> 00:09:17,440
variety of lenses we got many many

205
00:09:21,430 --> 00:09:19,360
lenses everything from these big lenses

206
00:09:23,990 --> 00:09:21,440
all the way to uh to very wide angle

207
00:09:25,829 --> 00:09:24,000
lenses uh to take all of the photography

208
00:09:27,590 --> 00:09:25,839
that we're asked to do and then of

209
00:09:30,389 --> 00:09:27,600
course all the volunteer photography

210
00:09:32,230 --> 00:09:30,399
that we choose to do

211
00:09:34,630 --> 00:09:32,240
all right go ahead ladies how do you

212
00:09:40,949 --> 00:09:34,640
feel whenever you float like what do you

213
00:09:44,790 --> 00:09:43,110

uh it's difficult to describe when you

214

00:09:46,710 --> 00:09:44,800

first get up here you feel like

215

00:09:48,790 --> 00:09:46,720

everything inside your body starts to

216

00:09:51,829 --> 00:09:48,800

float your your

217

00:09:53,910 --> 00:09:51,839

the organs inside your abdomen float up

218

00:09:55,430 --> 00:09:53,920

your shoulders your arms float up and

219

00:09:57,829 --> 00:09:55,440

you feel like your shoulders you're

220

00:10:00,230 --> 00:09:57,839

shrugging your shoulders continually

221

00:10:02,230 --> 00:10:00,240

then you get used to it after a while it

222

00:10:03,910 --> 00:10:02,240

takes a few days and and then you feel

223

00:10:06,470 --> 00:10:03,920

very comfortable but i would say that it

224

00:10:08,389 --> 00:10:06,480

takes about six weeks to fully acclimate

225

00:10:10,870 --> 00:10:08,399

and then you get to a point where there

226

00:10:13,110 --> 00:10:10,880

is no really logical up or down anymore

227

00:10:15,670 --> 00:10:13,120

you can work in any orientation and in

228

00:10:16,710 --> 00:10:15,680

your mind you just make anything up or

229

00:10:18,230 --> 00:10:16,720

down

230

00:10:20,150 --> 00:10:18,240

depending upon the task that you're

231

00:10:21,750 --> 00:10:20,160

doing you'll learn how to how to move

232

00:10:23,590 --> 00:10:21,760

around with your feet you don't need

233

00:10:27,670 --> 00:10:23,600

your hands to do it right now i'm i'm

234

00:10:29,509 --> 00:10:27,680

hooking my feet in handrails uh to uh to

235

00:10:31,110 --> 00:10:29,519

just kind of push myself around and

236

00:10:33,590 --> 00:10:31,120

catch myself and

237

00:10:36,069 --> 00:10:33,600

so you get very accustomed uh up here

238

00:10:37,269 --> 00:10:36,079

after a period of weeks

239

00:10:39,190 --> 00:10:37,279

wow

240

00:10:42,230 --> 00:10:39,200

so jeff you first flew on the space

241

00:10:43,829 --> 00:10:42,240

shuttle in 2000 yes it is now 16 years

242

00:10:45,430 --> 00:10:43,839

later have you noticed any visual

243

00:10:46,710 --> 00:10:45,440

differences on the surface of earth from

244

00:10:51,030 --> 00:10:46,720

your view

245

00:10:54,870 --> 00:10:52,630

that is a good question we hear about

246

00:10:56,230 --> 00:10:54,880

that all the time frankly i don't see a

247

00:10:57,990 --> 00:10:56,240

whole lot of difference of course

248

00:10:58,870 --> 00:10:58,000

there's differences in the details there

249

00:11:05,509 --> 00:10:58,880

have been

250

00:11:08,230 --> 00:11:05,519

development in agriculture there's been

251
00:11:10,230 --> 00:11:08,240
fields that that have left fallow there

252
00:11:12,790 --> 00:11:10,240
have been earthquakes of course

253
00:11:14,310 --> 00:11:12,800
periodically that have caused damage

254
00:11:15,509 --> 00:11:14,320
there have been storms that have come

255
00:11:18,230 --> 00:11:15,519
through hurricanes that have come

256
00:11:20,710 --> 00:11:18,240
through and caused change but all in all

257
00:11:22,630 --> 00:11:20,720
i don't see a lot of change now i do see

258
00:11:25,030 --> 00:11:22,640
changes over time

259
00:11:27,910 --> 00:11:25,040
for example when i first got here a few

260
00:11:30,630 --> 00:11:27,920
weeks ago the entire sahara desert in

261
00:11:32,550 --> 00:11:30,640
northern africa and half of asia the

262
00:11:35,269 --> 00:11:32,560
eastern part of asia was all full of

263
00:11:37,509 --> 00:11:35,279

dust storms and very hazy now it's

264

00:11:39,990 --> 00:11:37,519

cleared out again so africa is fairly

265

00:11:41,670 --> 00:11:40,000

clear and asia is starting to clear out

266

00:11:44,310 --> 00:11:41,680

those things pop up every once in a

267

00:11:47,110 --> 00:11:44,320

while and then they they go away i think

268

00:11:49,350 --> 00:11:47,120

that's the normal cycles of of weather

269

00:11:51,190 --> 00:11:49,360

patterns and and other phenomena on the

270

00:11:52,150 --> 00:11:51,200

earth

271

00:11:53,990 --> 00:11:52,160

so

272

00:11:55,670 --> 00:11:54,000

more questions all right two more

273

00:11:56,870 --> 00:11:55,680

questions so pick your best last

274

00:11:58,550 --> 00:11:56,880

question

275

00:12:01,110 --> 00:11:58,560

okay so

276

00:12:06,230 --> 00:12:01,120

what's the what does it smell like in

277

00:12:10,470 --> 00:12:08,470

like

278

00:12:15,190 --> 00:12:10,480

that's a

279

00:12:16,949 --> 00:12:15,200

right now i would say it doesn't smell

280

00:12:18,710 --> 00:12:16,959

like anything it uh

281

00:12:22,069 --> 00:12:18,720

it's a very clean

282

00:12:24,629 --> 00:12:22,079

um atmosphere however i will say when i

283

00:12:27,110 --> 00:12:24,639

first got here this time the smell was

284

00:12:28,949 --> 00:12:27,120

very familiar to me the smell of the

285

00:12:31,590 --> 00:12:28,959

space station it's sort of a

286

00:12:33,509 --> 00:12:31,600

laboratory smell i can't quite explain

287

00:12:35,670 --> 00:12:33,519

it it's unique to the space station but

288

00:12:38,150 --> 00:12:35,680

i found it was very strong when i first

289

00:12:40,470 --> 00:12:38,160

got on board but within a couple of days

290

00:12:42,470 --> 00:12:40,480

i acclimated to it and i can't smell it

291

00:12:44,550 --> 00:12:42,480

anymore when i asked when i arrived on

292

00:12:46,629 --> 00:12:44,560

board i asked my crewmates about it and

293

00:12:48,470 --> 00:12:46,639

they said oh we don't smell anything so

294

00:12:49,910 --> 00:12:48,480

you acclimate to the smells here but i

295

00:12:53,190 --> 00:12:49,920

would say it smells

296

00:12:55,590 --> 00:12:53,200

sort of like a unique uh laboratory

297

00:12:56,870 --> 00:12:55,600

oh okay awesome all right so last

298

00:12:59,110 --> 00:12:56,880

question

299

00:13:00,870 --> 00:12:59,120

well okay for this round but we got more

300

00:13:03,590 --> 00:13:00,880

after all right

301

00:13:09,430 --> 00:13:03,600

what is the most amazing thing that

302

00:13:13,509 --> 00:13:11,829

oh man there's a long list of amazing

303

00:13:15,030 --> 00:13:13,519

things i've seen in space i talked about

304

00:13:18,870 --> 00:13:15,040

that volcano

305

00:13:21,990 --> 00:13:18,880

before i've seen some amazing views of

306

00:13:24,550 --> 00:13:22,000

the bahamas the reefs i've seen amazing

307

00:13:28,389 --> 00:13:24,560

panoramas of mountain ranges on the

308

00:13:30,550 --> 00:13:28,399

horizon or oblique angles or or seeing

309

00:13:32,790 --> 00:13:30,560

places that i live or have lived in the

310

00:13:36,069 --> 00:13:32,800

past are always emotionally very good

311

00:13:38,069 --> 00:13:36,079

because you uh exciting to see that

312

00:13:40,550 --> 00:13:38,079

we saw a rocket launch a couple weeks

313

00:13:42,949 --> 00:13:40,560

ago we saw a rocket launching through

314

00:13:44,949 --> 00:13:42,959

space it was it was at night

315

00:13:48,150 --> 00:13:44,959

and it was the progress launching to

316

00:13:50,069 --> 00:13:48,160

deliver us cargo and we saw it way up

317

00:13:51,670 --> 00:13:50,079

above the atmosphere all the way till

318

00:13:54,230 --> 00:13:51,680

the main engine cut off that was an

319

00:13:56,389 --> 00:13:54,240

amazing event just recently

320

00:13:59,750 --> 00:13:56,399

wow that's great

321

00:14:03,430 --> 00:13:59,760

okay well jeff we have a huge festival

322

00:14:05,990 --> 00:14:03,440

here and they they scoured the entire

323

00:14:08,470 --> 00:14:06,000

festival for one student

324

00:14:10,069 --> 00:14:08,480

one special student so come up here

325

00:14:13,110 --> 00:14:10,079

while while we're talking about the one

326

00:14:15,430 --> 00:14:13,120

special student has a question for you

327

00:14:17,590 --> 00:14:15,440

and enter the stage

328

00:14:18,389 --> 00:14:17,600

come on out all right

329

00:14:21,910 --> 00:14:18,399

and

330

00:14:24,069 --> 00:14:21,920

your name my name is rachel okay rachel

331

00:14:26,389 --> 00:14:24,079

nice to meet you from around here i'm

332

00:14:28,470 --> 00:14:26,399

from maryland okay very good well this

333

00:14:30,949 --> 00:14:28,480

is jeff williams he's live on the space

334

00:14:32,870 --> 00:14:30,959

station so ask your question um what

335

00:14:37,750 --> 00:14:32,880

effect does gravity have on your brain

336

00:14:42,310 --> 00:14:40,150

a good question rachel the

337

00:14:43,509 --> 00:14:42,320

being up here does have impacts on your

338

00:14:46,230 --> 00:14:43,519

body

339

00:14:48,150 --> 00:14:46,240

on your brain i'm not sure other than i

340

00:14:49,590 --> 00:14:48,160

would say that

341

00:14:51,670 --> 00:14:49,600

you have to concentrate a little bit

342

00:14:54,470 --> 00:14:51,680

more up here than you do on the ground

343

00:14:57,030 --> 00:14:54,480

we have a couple of theories that uh

344

00:14:59,430 --> 00:14:57,040

that maybe support that our co2 levels

345

00:15:01,910 --> 00:14:59,440

are a little bit higher than they are

346

00:15:04,550 --> 00:15:01,920

on the planet and we think that that has

347

00:15:06,230 --> 00:15:04,560

something to do with it it's sort of a

348

00:15:07,829 --> 00:15:06,240

fullness in the head

349

00:15:09,750 --> 00:15:07,839

but that's that's how i would i don't

350

00:15:11,910 --> 00:15:09,760

know if you know what the effect it has

351

00:15:13,590 --> 00:15:11,920

on the brain per se but it does have an

352

00:15:15,750 --> 00:15:13,600

effect that you subjectively feel of

353

00:15:17,910 --> 00:15:15,760

course we have other effects our muscles

354

00:15:20,470 --> 00:15:17,920

and our bones can atrophy so we exercise

355

00:15:22,470 --> 00:15:20,480

every day to to prevent that so that we

356

00:15:27,509 --> 00:15:22,480

can be prepared to come back to earth

357

00:15:31,749 --> 00:15:29,269

okay well thank you very much rachel

358

00:15:34,069 --> 00:15:31,759

lester applause for rachel

359

00:15:36,389 --> 00:15:34,079

all right thank you thank you

360

00:15:38,550 --> 00:15:36,399

all right jeff and to close this all off

361

00:15:41,189 --> 00:15:38,560

we have about four more minutes and i'm

362

00:15:43,110 --> 00:15:41,199

gonna give you uh about a minute to to

363

00:15:45,189 --> 00:15:43,120

give final thoughts here in a few few

364

00:15:48,310 --> 00:15:45,199

minutes but social media has been

365

00:15:50,230 --> 00:15:48,320

buzzing yes and we have thousands of

366

00:15:53,990 --> 00:15:50,240

questions that have come

367

00:15:57,509 --> 00:15:54,000

have bubbled up but um but a couple ones

368

00:15:59,749 --> 00:15:57,519

are common themes and so one of them is

369

00:16:02,269 --> 00:15:59,759

what do you miss most

370

00:16:06,069 --> 00:16:02,279

from the earth you've been up there what

371

00:16:11,910 --> 00:16:06,079

28 days or so what do you miss most this

372

00:16:15,910 --> 00:16:14,150

uh well of course like i said before uh

373

00:16:17,670 --> 00:16:15,920

i alluded to it before one of the things

374

00:16:19,189 --> 00:16:17,680

you miss most of course is your family

375

00:16:21,030 --> 00:16:19,199

your family

376

00:16:23,509 --> 00:16:21,040

are they're on the ground they're

377

00:16:25,829 --> 00:16:23,519

waiting for you we're busy up here we're

378

00:16:27,509 --> 00:16:25,839

busy every day um but they're you know

379

00:16:30,470 --> 00:16:27,519

and they worry about us a little bit for

380

00:16:33,910 --> 00:16:30,480

obvious reasons this is not a um it has

381

00:16:36,870 --> 00:16:33,920

some risk being up here um and it's like

382

00:16:39,590 --> 00:16:36,880

all of us we all love relationships so

383

00:16:41,749 --> 00:16:39,600

family is what i miss the most

384

00:16:43,430 --> 00:16:41,759

okay and i was the same and i guess you

385

00:16:45,030 --> 00:16:43,440

ladies asked the former that question

386

00:16:46,949 --> 00:16:45,040

already but it sounds like the whole

387

00:16:49,189 --> 00:16:46,959

world wants to ask you that same

388

00:16:51,829 --> 00:16:49,199

question okay here's number two

389

00:16:57,430 --> 00:16:51,839

what plants would you would you like to

390

00:17:01,189 --> 00:16:58,790

oh good question well there's two

391

00:17:02,790 --> 00:17:01,199

categories i would say that one would be

392

00:17:04,470 --> 00:17:02,800

a category of plants that are just

393

00:17:06,309 --> 00:17:04,480

pleasant to have around

394

00:17:07,829 --> 00:17:06,319

uh you know like we have house plants or

395

00:17:10,309 --> 00:17:07,839

whatnot of course flowering plants would

396

00:17:12,230 --> 00:17:10,319

be great to have up here just to to

397

00:17:13,750 --> 00:17:12,240

spice up the place a little bit and the

398

00:17:15,350 --> 00:17:13,760

other category of plant that i would

399

00:17:16,549 --> 00:17:15,360

love to grow up here are plants that you

400

00:17:19,270 --> 00:17:16,559

can eat

401
00:17:21,429 --> 00:17:19,280
because it would be fresh food fresh

402
00:17:22,710 --> 00:17:21,439
vegetables or fruit and uh of course

403
00:17:25,350 --> 00:17:22,720
that's one of the things that we don't

404
00:17:27,029 --> 00:17:25,360
get very often up here

405
00:17:29,430 --> 00:17:27,039
wow okay and i see there's another

406
00:17:31,590 --> 00:17:29,440
repeat question so here's the next one

407
00:17:33,909 --> 00:17:31,600
are there any drones

408
00:17:35,190 --> 00:17:33,919
used in space and they might be talking

409
00:17:40,230 --> 00:17:35,200
about

410
00:17:43,430 --> 00:17:40,240
just unmanned things that move around in

411
00:17:47,669 --> 00:17:43,440
space either on the space station or off

412
00:17:51,190 --> 00:17:49,350
well we have an experiment called

413
00:17:53,510 --> 00:17:51,200

spheres where we have these uh

414

00:17:54,630 --> 00:17:53,520

volleyball sized

415

00:17:56,870 --> 00:17:54,640

objects

416

00:17:58,710 --> 00:17:56,880

and uh they can be programmed to fly

417

00:18:00,070 --> 00:17:58,720

around inside the space station it's an

418

00:18:01,750 --> 00:18:00,080

experiment we're not using it

419

00:18:03,510 --> 00:18:01,760

operationally so we do have those on

420

00:18:04,870 --> 00:18:03,520

board they've been here on board for

421

00:18:06,549 --> 00:18:04,880

many years

422

00:18:08,870 --> 00:18:06,559

i've executed that experiment all the

423

00:18:09,830 --> 00:18:08,880

way back to 2006.

424

00:18:11,590 --> 00:18:09,840

of course there are many other

425

00:18:13,990 --> 00:18:11,600

satellites in orbit around the earth in

426

00:18:16,150 --> 00:18:14,000

different orbits we don't use them

427

00:18:18,070 --> 00:18:16,160

directly we do use some of them for

428

00:18:19,110 --> 00:18:18,080

communication systems but we don't see

429

00:18:21,750 --> 00:18:19,120

them

430

00:18:23,350 --> 00:18:21,760

we try to

431

00:18:25,990 --> 00:18:23,360

avoid actually

432

00:18:27,669 --> 00:18:26,000

objects in space that might come close

433

00:18:29,190 --> 00:18:27,679

to colliding with the space station

434

00:18:30,870 --> 00:18:29,200

that's one of the things we worry about

435

00:18:32,470 --> 00:18:30,880

and occasionally we have to

436

00:18:35,029 --> 00:18:32,480

change the orbit of the space station

437

00:18:37,270 --> 00:18:35,039

just to avoid that but in general we

438

00:18:38,950 --> 00:18:37,280

don't uh we don't see or have direct

439

00:18:40,630 --> 00:18:38,960

contact with other satellites in earth

440

00:18:43,590 --> 00:18:40,640

orbit

441

00:18:45,990 --> 00:18:43,600

okay and and uh you all were involved in

442

00:18:47,990 --> 00:18:46,000

an hour of code right

443

00:18:50,230 --> 00:18:48,000

and there are kids that actually code

444

00:18:52,630 --> 00:18:50,240

these spheres that jeff

445

00:18:54,549 --> 00:18:52,640

has referenced they code from the ground

446

00:18:56,710 --> 00:18:54,559

and they have a competition up in space

447

00:18:59,110 --> 00:18:56,720

that's really cool okay jeff

448

00:19:01,190 --> 00:18:59,120

we only have like 90 seconds left i'd

449

00:19:04,470 --> 00:19:01,200

like to give you about a minute to share

450

00:19:06,630 --> 00:19:04,480

anything that we didn't share share just

451
00:19:08,310 --> 00:19:06,640
yet today so what do you want to tell

452
00:19:13,029 --> 00:19:08,320
all the parents the teachers and the

453
00:19:17,350 --> 00:19:15,110
well i just want to applaud your efforts

454
00:19:18,789 --> 00:19:17,360
and applaud the the uh

455
00:19:21,510 --> 00:19:18,799
what you're doing there you're all

456
00:19:23,990 --> 00:19:21,520
coming together to get energized to

457
00:19:26,950 --> 00:19:24,000
to inspire the young people to inspire

458
00:19:31,510 --> 00:19:26,960
of course teachers and educators

459
00:19:35,110 --> 00:19:33,750
transmitting knowledge and the ability

460
00:19:36,230 --> 00:19:35,120
to learn

461
00:19:40,390 --> 00:19:36,240
teaching

462
00:19:42,230 --> 00:19:40,400
young people how to learn how to study

463
00:19:43,990 --> 00:19:42,240

for their future and of course your

464

00:19:46,549 --> 00:19:44,000

focus is on science engineering

465

00:19:50,310 --> 00:19:46,559

technology which is great

466

00:19:52,150 --> 00:19:50,320

we need that in the world the world has

467

00:19:55,669 --> 00:19:52,160

civilizations have developed throughout

468

00:19:56,549 --> 00:19:55,679

history uh because of that uh we need

469

00:19:58,789 --> 00:19:56,559

good

470

00:20:00,630 --> 00:19:58,799

talented people on this program and

471

00:20:02,870 --> 00:20:00,640

other programs related to space

472

00:20:04,630 --> 00:20:02,880

exploration and other scientific

473

00:20:06,870 --> 00:20:04,640

endeavors on the ground so i applaud

474

00:20:09,430 --> 00:20:06,880

your efforts i i encourage you to

475

00:20:11,990 --> 00:20:09,440

continue down that path uh find the

476

00:20:14,310 --> 00:20:12,000

opportunities that uh that you get and

477

00:20:16,710 --> 00:20:14,320

and take advantage of them and and work

478

00:20:18,950 --> 00:20:16,720

hard and make a contribution we believe

479

00:20:21,830 --> 00:20:18,960

that the contributions made in science

480

00:20:24,549 --> 00:20:21,840

engineering and technology are are

481

00:20:26,470 --> 00:20:24,559

contributions that don't just

482

00:20:28,549 --> 00:20:26,480

benefit the individual but benefit

483

00:20:29,750 --> 00:20:28,559

mankind and it's always better if we can

484

00:20:31,830 --> 00:20:29,760

find a way

485

00:20:33,909 --> 00:20:31,840

to serve our fellow

486

00:20:35,590 --> 00:20:33,919

human beings for you educators out there

487

00:20:36,549 --> 00:20:35,600

i will say my father was a school

488

00:20:38,390 --> 00:20:36,559

teacher

489

00:20:40,230 --> 00:20:38,400

he was highly respected i still get

490

00:20:43,029 --> 00:20:40,240

feedback all the time from his former

491

00:20:44,149 --> 00:20:43,039

students through the 60s and and 70s and

492

00:20:46,710 --> 00:20:44,159

80s

493

00:20:49,350 --> 00:20:46,720

he invested in people's lives his whole

494

00:20:51,669 --> 00:20:49,360

life so i want to uh thank you and

495

00:20:54,549 --> 00:20:51,679

express my gratitude for your dedication

496

00:20:56,630 --> 00:20:54,559

and your willingness to dedicate uh to

497

00:20:58,870 --> 00:20:56,640

invest in in the lives of of young

498

00:20:59,909 --> 00:20:58,880

people have fun there in the festival as

499

00:21:02,630 --> 00:20:59,919

well

500

00:21:03,909 --> 00:21:02,640

and make new friends uh and friendships

501
00:21:07,270 --> 00:21:03,919
i hope will continue through your

502
00:21:10,630 --> 00:21:09,510
yeah they're clapping for you here this

503
00:21:12,710 --> 00:21:10,640
is awesome

504
00:21:14,870 --> 00:21:12,720
know you're busy up there i know you're

505
00:21:17,270 --> 00:21:14,880
working hard and you took time out of

506
00:21:18,789 --> 00:21:17,280
your busy day on behalf of the entire

507
00:21:19,669 --> 00:21:18,799
festival we want to thank you and your

508
00:21:22,149 --> 00:21:19,679
crew

509
00:21:28,070 --> 00:21:22,159
for a successful mission and a safe

510
00:21:32,710 --> 00:21:29,590
thank you all