



1
00:00:12,200 --> 00:00:09,950
hello I'm Jason Townsend from NASA's

2
00:00:13,880 --> 00:00:12,210
Office of Communications I'm the deputy

3
00:00:15,710 --> 00:00:13,890
social media manager here and I want to

4
00:00:17,720 --> 00:00:15,720
welcome you to today's NASA Google+

5
00:00:20,240 --> 00:00:17,730
Hangout exploring the space station and

6
00:00:21,950 --> 00:00:20,250
spacewalks and science on orbit this

7
00:00:23,750 --> 00:00:21,960
event connects NASA social media

8
00:00:25,700 --> 00:00:23,760
followers with astronauts were on the

9
00:00:26,810 --> 00:00:25,710
ground the recently returned from living

10
00:00:29,390 --> 00:00:26,820
and working aboard the space station

11
00:00:32,290 --> 00:00:29,400
orbiting some 230 miles above the earth

12
00:00:34,880 --> 00:00:32,300
and traveling at 17,500 miles per hour

13
00:00:38,090 --> 00:00:34,890

will be taking real-time questions using

14

00:00:40,760 --> 00:00:38,100

the hashtag pound ask Astro excuse me

15

00:00:43,400 --> 00:00:40,770

pound ask NASA on Twitter or from the

16

00:00:44,840 --> 00:00:43,410

NASA Google+ page during the event we've

17

00:00:46,310 --> 00:00:44,850

also opened up a comment thread on

18

00:00:48,650 --> 00:00:46,320

NASA's Facebook page where you can post

19

00:00:50,479 --> 00:00:48,660

questions let me introduce those who are

20

00:00:52,459 --> 00:00:50,489

joining us on today's hangout we have

21

00:00:55,970 --> 00:00:52,469

with us nasa astronaut suni williams and

22

00:00:58,279 --> 00:00:55,980

japanese astronaut aki hoshide both

23

00:01:02,060 --> 00:00:58,289

sunny and aki recently returned to Earth

24

00:01:04,460 --> 00:01:02,070

on November 18 2012 after spending 127

25

00:01:06,050 --> 00:01:04,470

days in space including 125 of those

26
00:01:08,510 --> 00:01:06,060
aboard the International Space Station

27
00:01:10,550 --> 00:01:08,520
we're also joined by two NASA Explorer

28
00:01:12,380 --> 00:01:10,560
schools on today's hangout we have with

29
00:01:13,850 --> 00:01:12,390
us high school science students from

30
00:01:18,559 --> 00:01:13,860
Dalton Intermediate School in Dalton

31
00:01:20,150 --> 00:01:18,569
Ohio wave guys hi we also have with us

32
00:01:22,070 --> 00:01:20,160
middle school science students from Our

33
00:01:25,779 --> 00:01:22,080
Lady of Perpetual Help Catholic School

34
00:01:30,949 --> 00:01:29,270
hi guys at this point I want to

35
00:01:32,300 --> 00:01:30,959
introduce to you guys our astronauts

36
00:01:33,559 --> 00:01:32,310
here they're gonna talk a little bit

37
00:01:36,620 --> 00:01:33,569
about their mission and we have a little

38
00:01:38,270 --> 00:01:36,630

video for you guys so take it away hi

39

00:01:41,080 --> 00:01:38,280

everybody we were psyched to be here

40

00:01:47,540 --> 00:01:45,139

so Aki and I like Jason said just got

41

00:01:49,729 --> 00:01:47,550

back from space in November so we've

42

00:01:52,249 --> 00:01:49,739

gone through a little physical rehab and

43

00:01:53,839 --> 00:01:52,259

now are raring to go to get ready to

44

00:01:56,300 --> 00:01:53,849

talk to you guys about what we did up in

45

00:01:59,240 --> 00:01:56,310

space so to start that we got a little

46

00:02:01,820 --> 00:01:59,250

video that shows some of the things that

47

00:02:03,979 --> 00:02:01,830

we did while we are up there it's gonna

48

00:02:06,650 --> 00:02:03,989

start off with a couple different crews

49

00:02:10,609 --> 00:02:06,660

of six because we'd be on a swimming

50

00:02:12,830 --> 00:02:10,619

spacecraft Soyuz have crews of three so

51
00:02:15,140 --> 00:02:12,840
there's two show use docked to the space

52
00:02:16,880 --> 00:02:15,150
station which means three plus three is

53
00:02:18,110 --> 00:02:16,890
six so six people are living on the

54
00:02:20,750 --> 00:02:18,120
space station

55
00:02:23,150 --> 00:02:20,760
now four Soyuz fly per year - in the

56
00:02:24,890 --> 00:02:23,160
spring and - in the fall so we alternate

57
00:02:26,449 --> 00:02:24,900
cruise back and forth and that's why

58
00:02:28,640 --> 00:02:26,459
you'll see different people in the

59
00:02:30,770 --> 00:02:28,650
pictures part of the video also shows

60
00:02:32,300 --> 00:02:30,780
our training strength training is pretty

61
00:02:34,070 --> 00:02:32,310
extensive it's about two and a half

62
00:02:37,280 --> 00:02:34,080
years of training not only here in the

63
00:02:40,820 --> 00:02:37,290

US but also of course in Japan in Russia

64

00:02:43,039 --> 00:02:40,830

in Canada and Europe and so we do a lot

65

00:02:45,890 --> 00:02:43,049

of traveling to support getting ready

66

00:02:47,660 --> 00:02:45,900

for this or our flight in space on the

67

00:02:49,130 --> 00:02:47,670

space station some of the things we're

68

00:02:52,160 --> 00:02:49,140

gonna do while we're up there is

69

00:02:54,259 --> 00:02:52,170

spacewalks and also some work with a

70

00:02:56,420 --> 00:02:54,269

robotic arm as well as lots and lots and

71

00:02:59,150 --> 00:02:56,430

lots of science experiments so in the

72

00:03:00,410 --> 00:02:59,160

video you're going to see some of the

73

00:03:02,539 --> 00:03:00,420

science experiments some of the stuff we

74

00:03:06,050 --> 00:03:02,549

do to ourselves take our blood take our

75

00:03:10,280 --> 00:03:06,060

urine look at our eyes for example

76

00:03:11,780 --> 00:03:10,290

you're gonna see what space walk what it

77

00:03:14,030 --> 00:03:11,790

looks like to be in a spacesuit and go

78

00:03:17,000 --> 00:03:14,040

on a spacewalk and you're also gonna see

79

00:03:19,520 --> 00:03:17,010

some of what we call visiting vehicles

80

00:03:20,960 --> 00:03:19,530

that come to the station for only a

81

00:03:23,479 --> 00:03:20,970

small amount of time but they're the

82

00:03:24,770 --> 00:03:23,489

ones who bring supplies food water

83

00:03:26,780 --> 00:03:24,780

clothes

84

00:03:29,690 --> 00:03:26,790

toothbrushes new experiments and even

85

00:03:32,690 --> 00:03:29,700

spiders sometimes so you'll see all of

86

00:03:35,089 --> 00:03:32,700

those spacecraft up there and then

87

00:03:38,599 --> 00:03:35,099

you're gonna see how we come back from

88

00:03:41,780 --> 00:03:38,609

space now you know we launch and come

89

00:03:44,180 --> 00:03:41,790

back from space in Kazakhstan and that's

90

00:03:47,569 --> 00:03:44,190

a country if you're familiar with it a

91

00:03:50,330 --> 00:03:47,579

little bit in the middle of the Asian

92

00:03:51,589 --> 00:03:50,340

continent just south of Russia and so

93

00:03:52,879 --> 00:03:51,599

you'll be able to see what a little bit

94

00:03:55,460 --> 00:03:52,889

of that looks like and you'll be able to

95

00:03:55,970 --> 00:03:55,470

see our Soyuz capsule from where we

96

00:03:58,309 --> 00:03:55,980

landed

97

00:03:59,720 --> 00:03:58,319

so with that Aki and I would like to

98

00:04:02,509 --> 00:03:59,730

show you the video and then we'll be

99

00:06:56,380 --> 00:04:02,519

ready for some questions - whatever you

100

00:07:03,050 --> 00:07:00,350

liftoff of the soyuz tma-05m carrying

101
00:07:04,760 --> 00:07:03,060
sunday williams yuri malenchenko and aki

102
00:09:41,730 --> 00:07:04,770
hooks today on a two-day journey to the

103
00:12:28,120 --> 00:09:44,050
suddenly us just became the era her

104
00:12:33,079 --> 00:12:31,310
all right thank you guys very very much

105
00:12:34,700 --> 00:12:33,089
for that wonderful video you guys

106
00:12:35,930 --> 00:12:34,710
obviously had some great experiences I

107
00:12:36,650 --> 00:12:35,940
hope you guys will share with everybody

108
00:12:38,900 --> 00:12:36,660
today

109
00:12:40,220 --> 00:12:38,910
on this hangout just a reminder for

110
00:12:41,510 --> 00:12:40,230
everybody who's watching we're taking

111
00:12:44,450 --> 00:12:41,520
real-time questions using the hashtag

112
00:12:46,670 --> 00:12:44,460
found ask NASA on Twitter or from the

113
00:12:48,050 --> 00:12:46,680

NASA Google+ page doing this event we've

114

00:12:49,400 --> 00:12:48,060

also opened up a thread on NASA's

115

00:12:51,620 --> 00:12:49,410

Facebook page where you can also post

116

00:12:52,850 --> 00:12:51,630

your questions without any further ado

117

00:12:54,410 --> 00:12:52,860

we're gonna go to our very first

118

00:13:02,420 --> 00:12:54,420

question from the doulton Intermediate

119

00:13:04,940 --> 00:13:02,430

School my name is Jackie I am an eighth

120

00:13:10,070 --> 00:13:04,950

grade student at Downton Intermediate

121

00:13:14,329 --> 00:13:10,080

School where either of you afraid during

122

00:13:17,540 --> 00:13:14,339

the spacewalks and how are you protected

123

00:13:23,720 --> 00:13:17,550

from the sun's radiation when you are on

124

00:13:25,600 --> 00:13:23,730

a spacewalk well heck yeah it's it's a

125

00:13:28,400 --> 00:13:25,610

little scary out there sometimes

126

00:13:31,190 --> 00:13:28,410

particularly when you look down and you

127

00:13:34,130 --> 00:13:31,200

see the earth zipping zipping by you at

128

00:13:35,810 --> 00:13:34,140

like a 17,000 miles an hour but you know

129

00:13:39,019 --> 00:13:35,820

we're trained pretty well you saw us

130

00:13:40,940 --> 00:13:39,029

doing all this stuff in the pool so we

131

00:13:42,380 --> 00:13:40,950

know what would our tasks are we know

132

00:13:43,820 --> 00:13:42,390

what we have to do when we get out there

133

00:13:46,230 --> 00:13:43,830

I really want to work and make sure we

134

00:13:48,449 --> 00:13:46,240

get that stuff done so you

135

00:13:50,610 --> 00:13:48,459

lie on the things that you that you

136

00:13:52,650 --> 00:13:50,620

learned for many years we did about two

137

00:13:54,780 --> 00:13:52,660

and a half years of training so you rely

138

00:13:57,180 --> 00:13:54,790

on their skills and you rely on each

139

00:13:58,889 --> 00:13:57,190

other as a team in case something

140

00:14:00,870 --> 00:13:58,899

happens to you the other guys gonna

141

00:14:03,120 --> 00:14:00,880

rescue you so you know we're pretty good

142

00:14:05,400 --> 00:14:03,130

buddies at this point in time that we

143

00:14:06,420 --> 00:14:05,410

our lifes depend on each other and yeah

144

00:14:09,210 --> 00:14:06,430

of course we have to worry about

145

00:14:12,000 --> 00:14:09,220

radiation but the suits have multiple

146

00:14:13,860 --> 00:14:12,010

layers of material to help us stay

147

00:14:15,630 --> 00:14:13,870

protected and so does the spacecraft

148

00:14:18,030 --> 00:14:15,640

itself the whole spacecraft has some

149

00:14:20,310 --> 00:14:18,040

protection on it of course we do get

150

00:14:22,320 --> 00:14:20,320

some radiation and so we wear a little

151

00:14:25,260 --> 00:14:22,330

dosimeter with us all the time so we

152

00:14:26,639 --> 00:14:25,270

come back to earth they can put that in

153

00:14:29,400 --> 00:14:26,649

a machine and they can understand how

154

00:14:30,900 --> 00:14:29,410

much radiation we do get and actually

155

00:14:32,910 --> 00:14:30,910

some folks on the ground are watching

156

00:14:35,760 --> 00:14:32,920

for solar flares and other big events

157

00:14:37,470 --> 00:14:35,770

like that that could help you know hurt

158

00:14:39,389 --> 00:14:37,480

us with the radiation and if it really

159

00:14:41,340 --> 00:14:39,399

gets bad and they detect that they know

160

00:14:43,380 --> 00:14:41,350

that they could tell us to go to a safe

161

00:14:45,810 --> 00:14:43,390

place on the space station to try to be

162

00:14:59,540 --> 00:14:45,820

a little bit further protected from the

163

00:15:06,300 --> 00:15:05,040

we're not hearing you sorry guys we're

164

00:15:07,949 --> 00:15:06,310

gonna go to our next question here from

165

00:15:16,440 --> 00:15:07,959

Our Lady of Perpetual Help Catholic

166

00:15:20,010 --> 00:15:16,450

school I'm Reagan this is kit

167

00:15:21,990 --> 00:15:20,020

Caroline and we'll our question how does

168

00:15:24,240 --> 00:15:22,000

being in space to thank you emotionally

169

00:15:26,670 --> 00:15:24,250

is it difficult to be with the same

170

00:15:30,000 --> 00:15:26,680

people for so long how do you resolve

171

00:15:37,819 --> 00:15:30,010

disputes does airplane be alone

172

00:15:43,230 --> 00:15:40,139

it's interesting you asked about that

173

00:15:47,040 --> 00:15:43,240

question you know you saw the video of

174

00:15:49,290 --> 00:15:47,050

our training - we trained about two and

175

00:15:51,360 --> 00:15:49,300

a half years before we launched so by

176

00:15:54,510 --> 00:15:51,370

the time we watched and you know get

177

00:15:57,269 --> 00:15:54,520

stuffed in that mall no it's not small

178

00:15:59,550 --> 00:15:57,279

it's a big and can up there the space

179

00:16:00,150 --> 00:15:59,560

station but by that time we're like

180

00:16:02,910 --> 00:16:00,160

family

181

00:16:07,970 --> 00:16:02,920

and you know signs like a sister he was

182

00:16:10,500 --> 00:16:07,980

like a brother to me so it wasn't

183

00:16:13,530 --> 00:16:10,510

together there you work together really

184

00:16:18,930 --> 00:16:13,540

well by that time so we didn't have any

185

00:16:22,410 --> 00:16:18,940

problems so what about tears tears yes

186

00:16:26,280 --> 00:16:22,420

so I'm on earth I guess it comes down

187

00:16:28,170 --> 00:16:26,290

right on your cheek well it just fixed

188

00:16:30,120 --> 00:16:28,180

there and it gets bigger and bigger I

189

00:16:32,130 --> 00:16:30,130

had something in my eye

190

00:16:34,189 --> 00:16:32,140

one time and you know you're closing

191

00:16:37,220 --> 00:16:34,199

your eye and trying to get it out just

192

00:16:39,540 --> 00:16:37,230

your tears and it just you know

193

00:16:42,510 --> 00:16:39,550

accumulates right there and just stays

194

00:16:50,130 --> 00:16:42,520

there it's like a ball in front of your

195

00:16:52,860 --> 00:16:50,140

face thank you thank you thank you guys

196

00:16:53,670 --> 00:16:52,870

very much our next question comes from

197

00:16:56,850 --> 00:16:53,680

Google+

198

00:16:58,519 --> 00:16:56,860

it's from Nihar Palmer who says I get

199

00:17:00,689 --> 00:16:58,529

sick I get a sick feeling on

200

00:17:04,409 --> 00:17:00,699

merry-go-rounds I know many people don't

201
00:17:06,419 --> 00:17:04,419
so do keep eat do people like me have a

202
00:17:08,320 --> 00:17:06,429
problem with space-related training and

203
00:17:11,550 --> 00:17:08,330
g-forces etc

204
00:17:13,650 --> 00:17:11,560
and how does that affect you injuries

205
00:17:15,880 --> 00:17:13,660
well I think you know you're

206
00:17:18,610 --> 00:17:15,890
uncomfortable with anything that's a

207
00:17:21,220 --> 00:17:18,620
little out of the ordinary at first I

208
00:17:23,350 --> 00:17:21,230
think for all of us to you know we fly

209
00:17:24,930 --> 00:17:23,360
airplanes and the first time I got into

210
00:17:28,480 --> 00:17:24,940
an airplane I didn't feel so good

211
00:17:30,040 --> 00:17:28,490
sitting in there was high and it was you

212
00:17:31,600 --> 00:17:30,050
know we were flying up you know loops

213
00:17:33,790 --> 00:17:31,610

and turns and stuff like that and I

214

00:17:35,710 --> 00:17:33,800

didn't feel so good but you know you get

215

00:17:38,620 --> 00:17:35,720

used to it your body really can adapt

216

00:17:40,750 --> 00:17:38,630

earlier if you're in good health so you

217

00:17:42,460 --> 00:17:40,760

can know what your body actually really

218

00:17:44,560 --> 00:17:42,470

what's cool about it it remembers the

219

00:17:46,510 --> 00:17:44,570

things that it's gone through before and

220

00:17:48,910 --> 00:17:46,520

you could work through some of those

221

00:17:50,800 --> 00:17:48,920

things for sure you know when I first

222

00:17:53,590 --> 00:17:50,810

went to space my first time I felt

223

00:17:55,420 --> 00:17:53,600

pretty sick so this time I was waiting

224

00:17:57,220 --> 00:17:55,430

for myself to get pretty sick and I

225

00:17:59,440 --> 00:17:57,230

think all sudden my brain goes oh yeah

226

00:18:01,450 --> 00:17:59,450

you didn't before it's like old news so

227

00:18:04,030 --> 00:18:01,460

I didn't get sick the second time so

228

00:18:05,320 --> 00:18:04,040

absolutely you can adapt so if you're

229

00:18:07,450 --> 00:18:05,330

don't worry about the merry-go-round

230

00:18:10,600 --> 00:18:07,460

then get back on that horse as they say

231

00:18:12,820 --> 00:18:10,610

and try it again and one advice I have

232

00:18:14,110 --> 00:18:12,830

for you is when if you do start to feel

233

00:18:16,630 --> 00:18:14,120

a little sick just look out toward the

234

00:18:18,130 --> 00:18:16,640

horizon if you look far focus far away

235

00:18:19,930 --> 00:18:18,140

and not really writing on what you're

236

00:18:25,660 --> 00:18:19,940

doing it seems to help you with getting

237

00:18:27,310 --> 00:18:25,670

any type of motion sickness alright our

238

00:18:30,580 --> 00:18:27,320

next question comes from Facebook here

239

00:18:32,380 --> 00:18:30,590

from Ian tanum who says I noticed that

240

00:18:33,310 --> 00:18:32,390

both of you have flown on both the Space

241

00:18:36,190 --> 00:18:33,320

Shuttle and I saw you

242

00:18:37,900 --> 00:18:36,200

what are some things that you liked or

243

00:18:41,860 --> 00:18:37,910

disliked or found unique about each

244

00:18:44,290 --> 00:18:41,870

spacecraft well you know it's a few

245

00:18:45,940 --> 00:18:44,300

different spacecrafts it's not you know

246

00:18:47,830 --> 00:18:45,950

one is better than the other you know

247

00:18:50,080 --> 00:18:47,840

Space Shuttle was designed to do so many

248

00:18:51,730 --> 00:18:50,090

things it can you know go up to the

249

00:18:54,910 --> 00:18:51,740

space station it can be its own

250

00:18:57,880 --> 00:18:54,920

laboratory and stay up in space for a

251

00:18:59,920 --> 00:18:57,890

week or two it can deploy satellite I

252

00:19:02,320 --> 00:18:59,930

can go to the Hubble telescope to repair

253

00:19:05,320 --> 00:19:02,330

it on the other hand the Soyuz

254

00:19:08,290 --> 00:19:05,330

spacecraft is really reliable to to

255

00:19:10,570 --> 00:19:08,300

bring people to station and then back

256

00:19:13,420 --> 00:19:10,580

and it also serves as a lifeboat

257

00:19:15,670 --> 00:19:13,430

now the Space Shuttle we can fit every

258

00:19:17,950 --> 00:19:15,680

people on the other hand the Soyuz only

259

00:19:21,370 --> 00:19:17,960

three and it's much smaller you know we

260

00:19:22,390 --> 00:19:21,380

were like like this crammed in there for

261

00:19:25,240 --> 00:19:22,400

two days

262

00:19:27,790 --> 00:19:25,250

and it's it is tight but it's reliable

263

00:19:31,570 --> 00:19:27,800

and for launch and landing we kind of

264

00:19:34,360 --> 00:19:31,580

joke around that we like to want I in a

265

00:19:37,150 --> 00:19:34,370

Soyuz spacecraft and then land on the

266

00:19:39,550 --> 00:19:37,160

shuttle because you know for launch the

267

00:19:42,580 --> 00:19:39,560

shuttle has this vibration because it

268

00:19:44,800 --> 00:19:42,590

has solid rocket boosters the Soyuz

269

00:19:48,790 --> 00:19:44,810

rocket has only liquid engines so it's a

270

00:19:50,890 --> 00:19:48,800

really a smooth ride for landing of

271

00:19:53,350 --> 00:19:50,900

course you know shuttle is like smooth

272

00:19:56,500 --> 00:19:53,360

glider just glides in and touches down

273

00:19:58,240 --> 00:19:56,510

on the runway whereas the Soyuz it just

274

00:20:00,370 --> 00:19:58,250

hits the ground we call it a soft

275

00:20:03,240 --> 00:20:00,380

landing but yeah you know what what that

276

00:20:06,460 --> 00:20:03,250

really means so there are differences

277

00:20:10,720 --> 00:20:06,470

can't really say which is better and

278

00:20:12,310 --> 00:20:10,730

it's just different all right wonderful

279

00:20:15,820 --> 00:20:12,320

we're gonna take our next question from

280

00:20:17,290 --> 00:20:15,830

Dalton Intermediate School my name is

281

00:20:18,970 --> 00:20:17,300

Christopher I am in the eighth grade

282

00:20:21,640 --> 00:20:18,980

stem class at downe Intermediate School

283

00:20:23,380 --> 00:20:21,650

we wrote a proposal for an experiment to

284

00:20:25,690 --> 00:20:23,390

be done in the Portland State University

285

00:20:32,550 --> 00:20:25,700

drop tower can you talk to us about how

286

00:20:36,160 --> 00:20:32,560

liquids behave in microgravity hey so I

287

00:20:38,650 --> 00:20:36,170

I don't know if you met dr. mark wangle

288

00:20:41,380 --> 00:20:38,660

who's part of the the Portland State

289

00:20:43,570 --> 00:20:41,390

drop tower he's a good friend of ours

290

00:20:45,370 --> 00:20:43,580

and he designed the capillary flow

291

00:20:46,900 --> 00:20:45,380

experiment that we did up on the space

292

00:20:50,350 --> 00:20:46,910

station that's been going on for quite

293

00:20:52,720 --> 00:20:50,360

some time it's pretty cool liquids do

294

00:20:54,460 --> 00:20:52,730

really neat things they form big spheres

295

00:20:54,970 --> 00:20:54,470

like if you see water coming out of a

296

00:20:56,950 --> 00:20:54,980

straw

297

00:21:00,580 --> 00:20:56,960

it doesn't forms this big cool sphere

298

00:21:02,440 --> 00:21:00,590

that you can use in in for washing your

299

00:21:03,580 --> 00:21:02,450

face brushing your teeth and all that

300

00:21:05,080 --> 00:21:03,590

kind of stuff

301

00:21:07,750 --> 00:21:05,090

but and that's just out in the open

302

00:21:09,550 --> 00:21:07,760

aspects atmosphere the capillary flow

303

00:21:12,330 --> 00:21:09,560

experiments were really awesome because

304

00:21:16,480 --> 00:21:12,340

they used different shapes within a

305

00:21:18,550 --> 00:21:16,490

vessel to make liquid take advantage of

306

00:21:20,590 --> 00:21:18,560

capillary flow without gravity so you

307

00:21:22,360 --> 00:21:20,600

can actually move liquid from one place

308

00:21:25,480 --> 00:21:22,370

to another which has really cool

309

00:21:27,610 --> 00:21:25,490

applications for maybe future fuel tanks

310

00:21:29,230 --> 00:21:27,620

and stuff like that so yeah I think

311

00:21:31,810 --> 00:21:29,240

we're pretty familiar with the work that

312

00:21:33,700 --> 00:21:31,820

those guys did we had the pleasure of

313

00:21:35,920 --> 00:21:33,710

doing more and more of their experiments

314

00:21:38,650 --> 00:21:35,930

up in space to see how

315

00:21:41,050 --> 00:21:38,660

liquids flow different viscosities and

316

00:21:42,970 --> 00:21:41,060

how we could take advantage of capillary

317

00:21:45,880 --> 00:21:42,980

flow in space because it's a something

318

00:21:49,210 --> 00:21:45,890

unique for space travel spacecraft so

319

00:21:50,410 --> 00:21:49,220

you guys I'm excited for you to be

320

00:21:52,210 --> 00:21:50,420

working with those guys they're pretty

321

00:21:58,210 --> 00:21:52,220

smart people so I hope you're having fun

322

00:21:59,470 --> 00:21:58,220

with them all right thank you wonderful

323

00:22:01,120 --> 00:21:59,480

we're gonna take our next question here

324

00:22:12,250 --> 00:22:01,130

from Our Lady of Perpetual helps

325

00:22:14,620 --> 00:22:12,260

Catholic school what happens if someone

326

00:22:17,530 --> 00:22:14,630

is seriously injured on a space station

327

00:22:19,570 --> 00:22:17,540

do bones heal differently when you get a

328

00:22:25,690 --> 00:22:19,580

cut is bleeding affected by the lack of

329

00:22:27,460 --> 00:22:25,700

gravity well first of all once our crew

330

00:22:29,770 --> 00:22:27,470

unfortunately we didn't have a medical

331

00:22:31,510 --> 00:22:29,780

doctor you know if it was we would be

332

00:22:34,000 --> 00:22:31,520

lucky if we had a medical doctor amongst

333

00:22:36,850 --> 00:22:34,010

the crew but we didn't so what do we do

334

00:22:39,370 --> 00:22:36,860

we have people called the crew Medical

335

00:22:41,170 --> 00:22:39,380

Officer get trained and actually Sonny

336

00:22:44,140 --> 00:22:41,180

and I were the crew medical officers

337

00:22:46,630 --> 00:22:44,150

one's an engineer one's a pilot but we

338

00:22:49,540 --> 00:22:46,640

still got training and we were able to

339

00:22:52,030 --> 00:22:49,550

you know help out if necessary of course

340

00:22:55,840 --> 00:22:52,040

we have doctors on the ground that would

341

00:22:57,850 --> 00:22:55,850

help us if we had an emergency we will

342

00:23:00,670 --> 00:22:57,860

talk to them and they'll give us some

343

00:23:03,310 --> 00:23:00,680

instructions and of course comes to

344

00:23:08,220 --> 00:23:03,320

worst we'll hear we'll get in our Soyuz

345

00:23:12,580 --> 00:23:08,230

and come back to earth for more help and

346

00:23:15,250 --> 00:23:12,590

well bounine what I don't know what

347

00:23:18,420 --> 00:23:15,260

happens to blood what happens to a cut

348

00:23:21,850 --> 00:23:18,430

all right I had a cut a little bit but I

349

00:23:25,150 --> 00:23:21,860

think it was not the same as it killed

350

00:23:26,740 --> 00:23:25,160

well just like on earth yeah I mean

351

00:23:28,990 --> 00:23:26,750

blood blood itself is just like another

352

00:23:30,580 --> 00:23:29,000

fluid so it's gonna fall up and make a

353

00:23:33,040 --> 00:23:30,590

ball if it gets loose and goes

354

00:23:35,110 --> 00:23:33,050

everywhere but we we took blood samples

355

00:23:36,730 --> 00:23:35,120

and sometimes we had a little bit of a

356

00:23:39,250 --> 00:23:36,740

spillage but we tried to contain that

357

00:23:40,840 --> 00:23:39,260

and luckily you I don't know if you

358

00:23:42,480 --> 00:23:40,850

could really break a bone in space it

359

00:23:44,800 --> 00:23:42,490

would be hard unless something sort of

360

00:23:48,170 --> 00:23:44,810

squished you because you know you're not

361

00:23:50,150 --> 00:23:48,180

falling or anything like that so

362

00:23:52,100 --> 00:23:50,160

we really I think the chances of

363

00:23:53,720 --> 00:23:52,110

breaking a bone might be pretty slim I'm

364

00:23:55,520 --> 00:23:53,730

not sure how that would heal though

365

00:23:57,080 --> 00:23:55,530

because bone density is a big problem

366

00:23:59,270 --> 00:23:57,090

which you probably can't you know

367

00:24:01,430 --> 00:23:59,280

generated this question so that might

368

00:24:03,140 --> 00:24:01,440

that could be really troublesome if you

369

00:24:05,420 --> 00:24:03,150

did have a broken bone in space for the

370

00:24:07,130 --> 00:24:05,430

healing of that so a great question and

371

00:24:09,080 --> 00:24:07,140

of course we have all the medications on

372

00:24:11,150 --> 00:24:09,090

board all the medical equipment if

373

00:24:18,790 --> 00:24:11,160

necessary if someone has a toothache we

374

00:24:24,260 --> 00:24:20,750

wonderful our next question comes from

375

00:24:26,180 --> 00:24:24,270

Twitter user at I'm hunter Smith hi I'm

376

00:24:28,100 --> 00:24:26,190

hunter I wanted to ask if you believe

377

00:24:31,630 --> 00:24:28,110

that life exists on other planets give

378

00:24:36,530 --> 00:24:34,760

well in our solar system I'm not exactly

379

00:24:39,590 --> 00:24:36,540

sure you know we're looking at Mars and

380

00:24:41,210 --> 00:24:39,600

that's why the most likely candidate but

381

00:24:43,010 --> 00:24:41,220

you know there's there's a million stars

382

00:24:45,290 --> 00:24:43,020

out there I think you guys can see it

383

00:24:46,910 --> 00:24:45,300

from where you are at night we could

384

00:24:48,590 --> 00:24:46,920

really see how many stars there were

385

00:24:50,930 --> 00:24:48,600

from the space station cuz we had that

386

00:24:53,180 --> 00:24:50,940

you know it's like a pair of nice pair

387

00:24:55,370 --> 00:24:53,190

of glasses without any humidity in the

388

00:24:57,770 --> 00:24:55,380

atmosphere to really see all of those

389

00:25:00,140 --> 00:24:57,780

stars out there in their full glory and

390

00:25:02,480 --> 00:25:00,150

actually see 3d as we look out into the

391

00:25:04,040 --> 00:25:02,490

universe so you know what's the

392

00:25:06,350 --> 00:25:04,050

probability there's millions of stars

393

00:25:08,720 --> 00:25:06,360

there's probably a couple planets or

394

00:25:10,940 --> 00:25:08,730

some planets orbiting at least a couple

395

00:25:12,410 --> 00:25:10,950

of a lot of those stars out there so the

396

00:25:15,650 --> 00:25:12,420

probability that there's going to be

397

00:25:17,630 --> 00:25:15,660

another earth-like third Rock from a

398

00:25:20,030 --> 00:25:17,640

star that is similar to ours yeah I

399

00:25:22,190 --> 00:25:20,040

would I would imagine that's probably is

400

00:25:24,260 --> 00:25:22,200

some life out there somewhere it just

401
00:25:25,850 --> 00:25:24,270
might be a little bit difficult for us

402
00:25:28,880 --> 00:25:25,860
to get there with our current engine

403
00:25:30,860 --> 00:25:28,890
technology so we need to work on that so

404
00:25:33,350 --> 00:25:30,870
we can zip around the universe a little

405
00:25:34,880 --> 00:25:33,360
quicker than we can today but like for

406
00:25:36,140 --> 00:25:34,890
our solar system Mars might be a

407
00:25:38,420 --> 00:25:36,150
candidate so that's why we have

408
00:25:40,550 --> 00:25:38,430
curiosity and other Rovers there in the

409
00:25:42,500 --> 00:25:40,560
future going there and hopefully you

410
00:25:44,390 --> 00:25:42,510
guys will be going there before too long

411
00:25:47,620 --> 00:25:44,400
as well to check it out with your own

412
00:25:52,400 --> 00:25:50,810
wonderful that's an awesome answer just

413
00:25:54,170 --> 00:25:52,410

a reminder for our online audience here

414

00:25:56,300 --> 00:25:54,180

we're taking real-time questions using

415

00:25:59,180 --> 00:25:56,310

the hashtag pound to ask NASA on Twitter

416

00:26:01,130 --> 00:25:59,190

and from NASA's Google+ page we've also

417

00:26:02,030 --> 00:26:01,140

opened up a comment thread on NASA's

418

00:26:04,460 --> 00:26:02,040

Facebook page where you

419

00:26:07,130 --> 00:26:04,470

host your questions as well our next

420

00:26:11,180 --> 00:26:07,140

question here comes from Twitter its

421

00:26:13,070 --> 00:26:11,190

user six of seven since the end of the

422

00:26:14,210 --> 00:26:13,080

space race the general public has not

423

00:26:16,580 --> 00:26:14,220

been as fascinating in this case

424

00:26:20,920 --> 00:26:16,590

exploration how do you think we can get

425

00:26:25,040 --> 00:26:23,390

well I hope we're doing it a little bit

426

00:26:27,560 --> 00:26:25,050

by doing this and talking to people in

427

00:26:29,060 --> 00:26:27,570

all these different social media venues

428

00:26:30,590 --> 00:26:29,070

that are out there nowadays because your

429

00:26:33,470 --> 00:26:30,600

generation is the one that's going to do

430

00:26:36,050 --> 00:26:33,480

a lot of exciting stuff you know when we

431

00:26:38,060 --> 00:26:36,060

first started flying and during the

432

00:26:39,440 --> 00:26:38,070

astronaut program we were flying the

433

00:26:41,270 --> 00:26:39,450

space shuttle and now the spatial of

434

00:26:43,910 --> 00:26:41,280

course is not flying anymore but what's

435

00:26:45,770 --> 00:26:43,920

good about that is you know that means

436

00:26:48,620 --> 00:26:45,780

we have money and time to dedicate to

437

00:26:50,420 --> 00:26:48,630

new programs and build spacecraft that

438

00:26:52,820 --> 00:26:50,430

will go out of low Earth orbit so I

439

00:26:54,290 --> 00:26:52,830

think what we have to do is just try to

440

00:26:56,450 --> 00:26:54,300

make sure we reach the next generation

441

00:26:58,640 --> 00:26:56,460

and know and make sure that they know

442

00:27:00,410 --> 00:26:58,650

that there are lots of opportunities out

443

00:27:02,960 --> 00:27:00,420

there and actually bigger and better

444

00:27:04,730 --> 00:27:02,970

things that you guys are gonna do then

445

00:27:06,590 --> 00:27:04,740

what we did you know if you thought we

446

00:27:08,750 --> 00:27:06,600

did was cool you guys are gonna go

447

00:27:11,330 --> 00:27:08,760

farther away from this planet and see

448

00:27:13,490 --> 00:27:11,340

our earth actually as a whole sphere how

449

00:27:15,290 --> 00:27:13,500

cool would that be you know we just are

450

00:27:16,880 --> 00:27:15,300

in low-earth orbit you guys are the ones

451
00:27:20,480 --> 00:27:16,890
who are gonna go back to the moon onto

452
00:27:22,580 --> 00:27:20,490
an asteroid and possibly to Mars so I

453
00:27:24,320 --> 00:27:22,590
think it's exciting I just think you

454
00:27:25,790 --> 00:27:24,330
guys have to be know that you're gonna

455
00:27:27,290 --> 00:27:25,800
do it you have to be determined and

456
00:27:29,570 --> 00:27:27,300
ready to get to take those

457
00:27:31,100 --> 00:27:29,580
responsibilities because you guys will

458
00:27:38,440 --> 00:27:31,110
you'll be the ones that will be watching

459
00:27:41,360 --> 00:27:40,310
wonderful before we go back to the

460
00:27:42,860 --> 00:27:41,370
schools we just got a really good

461
00:27:45,530 --> 00:27:42,870
question here on Twitter from miss band

462
00:27:50,420 --> 00:27:45,540
room 23 what's the scariest thing that

463
00:28:03,980 --> 00:27:50,430

you've come across in space mmm scariest

464

00:28:07,070 --> 00:28:03,990

thing I don't know maybe sunny I was

465

00:28:10,820 --> 00:28:07,080

never scared I thought I would be very

466

00:28:12,590 --> 00:28:10,830

nervous for launch because that's a very

467

00:28:15,769 --> 00:28:12,600

critical moment and you know it's the

468

00:28:18,139 --> 00:28:15,779

first step but going up to space but

469

00:28:20,209 --> 00:28:18,149

or my two flights first I'm a shuttle

470

00:28:22,039 --> 00:28:20,219

Discovery and this time on the Soyuz I

471

00:28:25,159 --> 00:28:22,049

felt really comfortable and that's

472

00:28:28,339 --> 00:28:25,169

because you've trained so many times and

473

00:28:30,440 --> 00:28:28,349

you see things just like you trained and

474

00:28:32,709 --> 00:28:30,450

also because you're together with your

475

00:28:35,359 --> 00:28:32,719

families you know sunny yuri malenchenko

476

00:28:37,099 --> 00:28:35,369

we were together on the soyuz on the

477

00:28:38,779 --> 00:28:37,109

launch pad and we trained together for

478

00:28:41,149 --> 00:28:38,789

two and a half years so we're family

479

00:28:43,820 --> 00:28:41,159

like I said and you're there together

480

00:28:45,889 --> 00:28:43,830

with them so I think that's why I felt

481

00:28:48,859 --> 00:28:45,899

comfortable so other than that I don't

482

00:28:54,440 --> 00:28:48,869

know I never had a something that scared

483

00:28:55,579 --> 00:28:54,450

me wonderful then we're gonna take our

484

00:28:59,959 --> 00:28:55,589

next question from the Dalton

485

00:29:01,849 --> 00:28:59,969

Intermediate School hi my name is Alex

486

00:29:04,190 --> 00:29:01,859

plants I am in the seventh grade at

487

00:29:05,810 --> 00:29:04,200

Dalton an intermediate school when you

488

00:29:07,909 --> 00:29:05,820

are at on the International Space

489

00:29:10,969 --> 00:29:07,919

Station how long does it take you to

490

00:29:13,009 --> 00:29:10,979

orbit Earth also have you ever seen the

491

00:29:17,269 --> 00:29:13,019

Great Wall of China or the Grand Canyon

492

00:29:20,509 --> 00:29:17,279

from space yeah so we we go and people

493

00:29:22,310 --> 00:29:20,519

say this big number right is 17,500

494

00:29:24,079 --> 00:29:22,320

miles an hour approximately is how fast

495

00:29:26,269 --> 00:29:24,089

we're traveling so what that means it

496

00:29:29,180 --> 00:29:26,279

takes about 90 minutes to go all the way

497

00:29:31,969 --> 00:29:29,190

across the planet about five miles a

498

00:29:35,419 --> 00:29:31,979

second around the planet rather five

499

00:29:38,029 --> 00:29:35,429

miles a second so we have 45 minutes

500

00:29:40,519 --> 00:29:38,039

proximately of day time about 45 minutes

501
00:29:42,889 --> 00:29:40,529
of night time as we're as we're floating

502
00:29:46,039 --> 00:29:42,899
around but luckily they have lights on

503
00:29:48,139 --> 00:29:46,049
the ceiling on the ceiling in the space

504
00:29:49,639 --> 00:29:48,149
station and so we keep the lights on for

505
00:29:52,369 --> 00:29:49,649
the daytime and then we turn the lights

506
00:29:54,349 --> 00:29:52,379
off for our night time so we try to get

507
00:29:57,529 --> 00:29:54,359
a normal nighttime sleep just like you

508
00:29:59,479 --> 00:29:57,539
guys do back on earth and I don't know

509
00:30:02,749 --> 00:29:59,489
my Chinese geography as well as I should

510
00:30:04,729 --> 00:30:02,759
so I was able to pick out some major

511
00:30:07,070 --> 00:30:04,739
towns but I wasn't able to see exactly

512
00:30:08,899 --> 00:30:07,080
where the Great Wall of China was did

513
00:30:10,700 --> 00:30:08,909

you see it and yeah actually I was

514

00:30:13,339 --> 00:30:10,710

trying to see it too

515

00:30:15,950 --> 00:30:13,349

you know we have a application on our

516

00:30:18,469 --> 00:30:15,960

laptop on board called world maps so you

517

00:30:20,869 --> 00:30:18,479

know the trajectory of the station and

518

00:30:24,829 --> 00:30:20,879

you know what is coming in the next

519

00:30:27,589 --> 00:30:24,839

orbit so I was trying to look for it and

520

00:30:29,550 --> 00:30:27,599

it is hard to see especially if that if

521

00:30:31,590 --> 00:30:29,560

there's no contrast

522

00:30:34,770 --> 00:30:31,600

Queen the environment and itself for

523

00:30:36,990 --> 00:30:34,780

instance the the pyramids in Egypt it is

524

00:30:39,390 --> 00:30:37,000

really hard unless you know exactly

525

00:30:42,480 --> 00:30:39,400

where it is then you can find it but

526

00:30:45,810 --> 00:30:42,490

it's hard to see if is you know brown on

527

00:30:47,490 --> 00:30:45,820

brown it's it's really hard to see now

528

00:30:51,750 --> 00:30:47,500

on the other hand if you have contrast

529

00:30:53,850 --> 00:30:51,760

it is easy to pick up like the runway at

530

00:30:57,960 --> 00:30:53,860

Kennedy Space Center it's easy to pick

531

00:30:58,800 --> 00:30:57,970

out Central Park in New York it was easy

532

00:31:01,890 --> 00:30:58,810

to pick out

533

00:31:04,860 --> 00:31:01,900

so those if you have contrast since it

534

00:31:06,690 --> 00:31:04,870

was easy to pick it out but I was not

535

00:31:08,880 --> 00:31:06,700

able to see the payroll of China either

536

00:31:11,160 --> 00:31:08,890

but we did see the Grand Canyon for sure

537

00:31:13,260 --> 00:31:11,170

and you know what that looked like I

538

00:31:15,210 --> 00:31:13,270

mean you have a vision of what it looks

539

00:31:17,040 --> 00:31:15,220

like in your mind from the pictures and

540

00:31:18,840 --> 00:31:17,050

when you can see you know the wall the

541

00:31:21,270 --> 00:31:18,850

edge and stuff like that that's not how

542

00:31:24,960 --> 00:31:21,280

it looks from space from space it really

543

00:31:28,140 --> 00:31:24,970

looks like something variegated and like

544

00:31:30,510 --> 00:31:28,150

a like a big crack and with layers on it

545

00:31:32,580 --> 00:31:30,520

from above it looks almost flat or like

546

00:31:34,650 --> 00:31:32,590

a pancake but you can see like a key

547

00:31:37,530 --> 00:31:34,660

said the contrast of the different

548

00:31:39,030 --> 00:31:37,540

pieces of the sides that are going

549

00:31:40,800 --> 00:31:39,040

closer and closer and closer to the

550

00:31:42,840 --> 00:31:40,810

Colorado River going through the center

551
00:31:44,640 --> 00:31:42,850
of it so yeah you could definitely see

552
00:31:47,100 --> 00:31:44,650
it and you could see how blue the water

553
00:31:49,470 --> 00:31:47,110
is that's going through it the contrast

554
00:31:51,600 --> 00:31:49,480
of the colors like bright are like

555
00:31:54,000 --> 00:31:51,610
goldish brown to blue it's very obvious

556
00:31:55,230 --> 00:31:54,010
so yeah we've sorted quite a few times

557
00:31:59,850 --> 00:31:55,240
as a matter of fact coming across the

558
00:32:01,080 --> 00:31:59,860
country thank you wonderful our next

559
00:32:21,990 --> 00:32:01,090
question comes from Our Lady of

560
00:32:24,150 --> 00:32:22,000
Perpetual Help Catholic school hey I

561
00:32:25,470 --> 00:32:24,160
think the question I would go a little

562
00:32:27,570 --> 00:32:25,480
bit soft in the background there but I

563
00:32:29,310 --> 00:32:27,580

think your question was how is it

564

00:32:37,210 --> 00:32:29,320

emotionally and physically coming back

565

00:32:43,930 --> 00:32:39,700

yeah that sounds about right okay all

566

00:32:45,580 --> 00:32:43,940

right so physically in you might have

567

00:32:47,740 --> 00:32:45,590

seen pictures of people coming back from

568

00:32:49,960 --> 00:32:47,750

space think you know that's the soft

569

00:32:52,690 --> 00:32:49,970

landing and the capsule bumps on the

570

00:32:55,270 --> 00:32:52,700

ground like a car crash we roll for a

571

00:32:57,040 --> 00:32:55,280

little bit and we and then the rescue

572

00:32:59,680 --> 00:32:57,050

forces come they open the hatch and then

573

00:33:01,960 --> 00:32:59,690

they pull us out of the spacecraft and

574

00:33:03,250 --> 00:33:01,970

you see people pulling us out and it's

575

00:33:04,690 --> 00:33:03,260

sort of funny because everyone goes oh

576

00:33:08,470 --> 00:33:04,700

my god you must have been incapacitated

577

00:33:10,210 --> 00:33:08,480

or is something wrong with you no it's

578

00:33:11,860 --> 00:33:10,220

just a little bit easier that's not like

579

00:33:14,380 --> 00:33:11,870

steps to get out of there it's just a

580

00:33:16,270 --> 00:33:14,390

little inconvenience to climb out of

581

00:33:18,690 --> 00:33:16,280

there and then plop on the ground and so

582

00:33:21,670 --> 00:33:18,700

the rescue forces actually pulled us out

583

00:33:23,710 --> 00:33:21,680

we could actually walk but the more

584

00:33:25,840 --> 00:33:23,720

difficulty thing was a little bit of the

585

00:33:28,870 --> 00:33:25,850

neurovestibular it's your head back and

586

00:33:31,110 --> 00:33:28,880

forth the balance of your inner ear and

587

00:33:34,450 --> 00:33:31,120

your brain net connection getting back

588

00:33:36,610 --> 00:33:34,460

situated back to gravity once again and

589

00:33:37,690 --> 00:33:36,620

so that takes probably a day or two

590

00:33:40,150 --> 00:33:37,700

until you're better

591

00:33:42,160 --> 00:33:40,160

we have exercise equipment on the space

592

00:33:44,920 --> 00:33:42,170

station a bike a treadmill and

593

00:33:46,900 --> 00:33:44,930

weightlifting equipment so that were

594

00:33:52,120 --> 00:33:46,910

bones and our muscles are pretty strong

595

00:33:54,310 --> 00:33:52,130

swear a belong now emotionally we it

596

00:33:56,650 --> 00:33:54,320

takes about 24 hours after landing for

597

00:33:58,630 --> 00:33:56,660

us to get back to the United States and

598

00:34:01,450 --> 00:33:58,640

that's where our family and friends are

599

00:34:03,880 --> 00:34:01,460

waiting for us and it is it is a little

600

00:34:06,550 --> 00:34:03,890

bit of a jolt to the system after being

601
00:34:08,500 --> 00:34:06,560
up there with only three or six people

602
00:34:10,900 --> 00:34:08,510
and then seeing a whole lot of people

603
00:34:12,400 --> 00:34:10,910
and seeing really the fit you're really

604
00:34:15,070 --> 00:34:12,410
close family and friends your parents

605
00:34:16,780 --> 00:34:15,080
and your husbands or wives or dogs or

606
00:34:20,350 --> 00:34:16,790
kids and you know the things that you

607
00:34:23,890 --> 00:34:20,360
really love it's a little overwhelming

608
00:34:26,260 --> 00:34:23,900
but soon enough your husband wears his

609
00:34:28,750 --> 00:34:26,270
dirty shoes in the house and your dog

610
00:34:31,480 --> 00:34:28,760
makes a mess and then you get tired of

611
00:34:33,160 --> 00:34:31,490
them again so I'm just joking but you

612
00:34:35,260 --> 00:34:33,170
know things get back to normal right

613
00:34:38,530 --> 00:34:35,270

away you can't avoid normal life on

614

00:34:41,260 --> 00:34:38,540

earth so it gets back and unfortunately

615

00:34:44,170 --> 00:34:41,270

we felt our bodies turning back to

616

00:34:46,720 --> 00:34:44,180

gravity and the pieces of microgravity

617

00:34:49,030 --> 00:34:46,730

slipping away as every second ticked by

618

00:34:50,980 --> 00:34:49,040

so a little sad to leave microgravity

619

00:34:55,450 --> 00:34:50,990

step by step

620

00:34:58,810 --> 00:34:55,460

thank you thank you wonderful

621

00:35:00,400 --> 00:34:58,820

so another Twitter user here asks how do

622

00:35:02,079 --> 00:35:00,410

you feel about the Soyuz launching and

623

00:35:07,200 --> 00:35:02,089

docking to the station in just six hours

624

00:35:12,849 --> 00:35:11,079

well so on our flight we actually had

625

00:35:15,310 --> 00:35:12,859

two days to Rhonda wind up with a

626
00:35:17,470 --> 00:35:15,320
station so that means we launched that

627
00:35:20,620 --> 00:35:17,480
was a long day and then we had two more

628
00:35:23,859 --> 00:35:20,630
days to get closer and closer to station

629
00:35:26,859 --> 00:35:23,869
what were we doing during that two days

630
00:35:29,859 --> 00:35:26,869
is we were doing some maneuvers getting

631
00:35:32,800 --> 00:35:29,869
closer so that we had to fire the

632
00:35:35,980 --> 00:35:32,810
Rockets a couple times but other than

633
00:35:39,130 --> 00:35:35,990
that we were just resting for like 15

634
00:35:42,520 --> 00:35:39,140
hours a day I thought I could sleep

635
00:35:45,940 --> 00:35:42,530
anywhere anytime as long as I could but

636
00:35:50,020 --> 00:35:45,950
the second day was tough for me

637
00:35:52,329 --> 00:35:50,030
so you know a six hour rendezvous it's

638
00:35:53,950 --> 00:35:52,339

cool you know you have to understand

639

00:35:56,320 --> 00:35:53,960

that it's going to be a longer day and

640

00:35:59,380 --> 00:35:56,330

at the very end it might be a very

641

00:36:01,570 --> 00:35:59,390

critical moment so fatigue is a factor

642

00:36:04,990 --> 00:36:01,580

but I think everyone has a good plan

643

00:36:08,620 --> 00:36:05,000

they can kind of download if something

644

00:36:11,859 --> 00:36:08,630

happens to the two-day rendezvous if

645

00:36:14,140 --> 00:36:11,869

necessary so we do have a plan I think

646

00:36:16,170 --> 00:36:14,150

it's a good idea and and it's kind of

647

00:36:20,560 --> 00:36:16,180

interesting to see the transition from

648

00:36:24,220 --> 00:36:20,570

two-day rendezvous to just six hours so

649

00:36:25,450 --> 00:36:24,230

going up you know you you've launched in

650

00:36:28,359 --> 00:36:25,460

the morning and then that afternoon

651
00:36:31,900 --> 00:36:28,369
you're already on the station and like

652
00:36:35,589 --> 00:36:31,910
spacex dragon you know we we had one

653
00:36:37,300 --> 00:36:35,599
dragon and we released it and then you

654
00:36:40,510 --> 00:36:37,310
know maybe it was lunch time I think

655
00:36:43,030 --> 00:36:40,520
when we released it by that evening it

656
00:36:45,940 --> 00:36:43,040
was already on on the ground or on the

657
00:36:48,460 --> 00:36:45,950
ocean so it's that quick nowadays so

658
00:36:53,920 --> 00:36:48,470
it's it doesn't take a long journey to

659
00:36:54,310 --> 00:36:53,930
go up to space so it's kind of cool very

660
00:36:56,680 --> 00:36:54,320
cool

661
00:36:59,829 --> 00:36:56,690
our next question here comes from a

662
00:37:01,540 --> 00:36:59,839
Heather BJ on Facebook how is it on your

663
00:37:03,370 --> 00:37:01,550

body to feel the effects of gravity

664

00:37:04,660 --> 00:37:03,380

after returning to Earth what exactly

665

00:37:06,569 --> 00:37:04,670

did you have to do to rehabilitate

666

00:37:09,160 --> 00:37:06,579

yourself

667

00:37:10,210 --> 00:37:09,170

so after coming back you know we talked

668

00:37:13,390 --> 00:37:10,220

a little bit about the neurovestibular

669

00:37:16,269 --> 00:37:13,400

stuff already that's the that's a big

670

00:37:19,359 --> 00:37:16,279

challenge but because you don't want to

671

00:37:21,279 --> 00:37:19,369

fall over in front of all your friends

672

00:37:23,589 --> 00:37:21,289

and so you you're working really hard

673

00:37:25,690 --> 00:37:23,599

and some people actually described Aki

674

00:37:27,309 --> 00:37:25,700

and I on our way home and was looking

675

00:37:28,749 --> 00:37:27,319

like zombies because you know you don't

676

00:37:31,900 --> 00:37:28,759

want to turn your head too much you sort

677

00:37:34,089 --> 00:37:31,910

of want to walk steady and still so that

678

00:37:36,489 --> 00:37:34,099

takes a little bit of time then we

679

00:37:38,079 --> 00:37:36,499

actually work with our trainers physical

680

00:37:41,079 --> 00:37:38,089

trainers sort of like the gym teachers

681

00:37:43,150 --> 00:37:41,089

in a gym back at Johnson Space Center

682

00:37:45,489 --> 00:37:43,160

and we go through a lot of exercises to

683

00:37:47,739 --> 00:37:45,499

include a lot of stretching and then

684

00:37:50,049 --> 00:37:47,749

building slowly but surely in the

685

00:37:51,819 --> 00:37:50,059

weights to try to make sure that you can

686

00:37:54,220 --> 00:37:51,829

you're as strong as you were before you

687

00:37:55,660 --> 00:37:54,230

left and with the exercise equipment up

688

00:37:57,549 --> 00:37:55,670

and at the space station

689

00:37:59,710 --> 00:37:57,559

Aki and I within probably a couple of

690

00:38:02,259 --> 00:37:59,720

weeks were were right back to where we

691

00:38:05,559 --> 00:38:02,269

were before we left one of the

692

00:38:08,079 --> 00:38:05,569

overarching things that I felt also

693

00:38:09,309 --> 00:38:08,089

those was I was tired you know maybe we

694

00:38:10,720 --> 00:38:09,319

were working quite a bit while we're up

695

00:38:12,700 --> 00:38:10,730

on the space station that might have got

696

00:38:14,979 --> 00:38:12,710

us tired but I think it's actually just

697

00:38:17,140 --> 00:38:14,989

gravity you know up in space you don't

698

00:38:18,519 --> 00:38:17,150

your body's not fighting against gravity

699

00:38:20,829 --> 00:38:18,529

little do you guys know your heads are

700

00:38:22,870 --> 00:38:20,839

very heavy when you come back to earth

701
00:38:25,180 --> 00:38:22,880
takes a little bit of muscle to hold

702
00:38:27,670 --> 00:38:25,190
your head up and just to hold yourself

703
00:38:29,769 --> 00:38:27,680
up and you I think your body just has to

704
00:38:31,329 --> 00:38:29,779
get used to that and get you know get a

705
00:38:33,489 --> 00:38:31,339
little bit of sleep to make sure your

706
00:38:35,680 --> 00:38:33,499
muscles aren't regenerated correctly so

707
00:38:39,370 --> 00:38:35,690
I felt sleepy for about a month and now

708
00:38:42,960 --> 00:38:39,380
as you can tell I'm very peppy that's

709
00:38:46,779 --> 00:38:45,099
wonderful then one last question here

710
00:38:48,849 --> 00:38:46,789
from Twitter from app Peggy Lambertson

711
00:38:53,200 --> 00:38:48,859
are you both great at math and his math

712
00:38:55,599 --> 00:38:53,210
important to astronauts I don't know if

713
00:38:57,759 --> 00:38:55,609

I'm great at math but I liked it as an

714

00:39:01,239 --> 00:38:57,769

elementary student I really like math

715

00:39:04,720 --> 00:39:01,249

and it's like a problem-solving and it's

716

00:39:06,460 --> 00:39:04,730

like a game or a quiz to me so I really

717

00:39:09,640 --> 00:39:06,470

liked it I don't know if I was great or

718

00:39:11,349 --> 00:39:09,650

not but yeah I just liked it and I did

719

00:39:13,539 --> 00:39:11,359

well at math because I wanted to not

720

00:39:15,190 --> 00:39:13,549

have to carry my big fat math book home

721

00:39:17,380 --> 00:39:15,200

now you guys probably don't have that

722

00:39:18,410 --> 00:39:17,390

issue because you do try most of your

723

00:39:20,660 --> 00:39:18,420

stuff through

724

00:39:23,990 --> 00:39:20,670

computer but I used to get on my math

725

00:39:25,490 --> 00:39:24,000

homework done really quick so it I

726

00:39:27,859 --> 00:39:25,500

didn't have to do it later which I think

727

00:39:32,480 --> 00:39:27,869

made me good and quick at

728

00:39:34,039 --> 00:39:32,490

problem-solving apparently wonderful

729

00:39:35,480 --> 00:39:34,049

then just to remind our online audience

730

00:39:37,760 --> 00:39:35,490

here we're taking real-time questions

731

00:39:40,130 --> 00:39:37,770

using the hashtag pound asknasa on

732

00:39:42,710 --> 00:39:40,140

Twitter and from the NASA Google+ page

733

00:39:44,210 --> 00:39:42,720

you can also find a comment thread open

734

00:39:46,309 --> 00:39:44,220

on our NASA Facebook page where you can

735

00:39:47,180 --> 00:39:46,319

also post our questions our next

736

00:39:50,390 --> 00:39:47,190

question is going to come from the

737

00:39:51,890 --> 00:39:50,400

Dalton Intermediate School hi my name is

738

00:39:54,530 --> 00:39:51,900

James Moore Hart I'm in the eighth grade

739

00:39:56,359 --> 00:39:54,540

elementary medium school my question is

740

00:39:59,410 --> 00:39:56,369

do you need to learn other languages to

741

00:40:02,569 --> 00:39:59,420

work on the International Space Station

742

00:40:05,750 --> 00:40:02,579

he actually does speak Japanese can you

743

00:40:08,180 --> 00:40:05,760

believe it because I had to study you

744

00:40:10,339 --> 00:40:08,190

have to study Japanese that was my

745

00:40:13,400 --> 00:40:10,349

second language now I'm just kidding so

746

00:40:15,500 --> 00:40:13,410

so you know being in Japanese I had to

747

00:40:18,230 --> 00:40:15,510

learn English and Russian

748

00:40:21,160 --> 00:40:18,240

lucky for me I grew up in New Jersey so

749

00:40:25,549 --> 00:40:21,170

of English was not that big of a deal

750

00:40:27,400 --> 00:40:25,559

but learning Russian you know after what

751
00:40:30,799 --> 00:40:27,410
ten years after graduating from college

752
00:40:34,250 --> 00:40:30,809
that's a big deal I mean you you know

753
00:40:37,700 --> 00:40:34,260
you have to understand the grammar you

754
00:40:39,620 --> 00:40:37,710
have to learn new words and it took me

755
00:40:42,799 --> 00:40:39,630
like ten years to get to where I am

756
00:40:44,809 --> 00:40:42,809
right now but it's rewarding as well as

757
00:40:46,789 --> 00:40:44,819
you know you go to Star City you go to

758
00:40:50,599 --> 00:40:46,799
Russia you try to communicate with

759
00:40:54,559 --> 00:40:50,609
instructors and you know slowly but

760
00:40:56,450 --> 00:40:54,569
gradually you do get to be able to talk

761
00:40:58,960 --> 00:40:56,460
to them communicate with them in Russian

762
00:41:02,180 --> 00:40:58,970
and that was really rewarding and you do

763
00:41:06,260 --> 00:41:02,190

get to learn about the culture as well

764

00:41:09,170 --> 00:41:06,270

and and on board the space station

765

00:41:11,809 --> 00:41:09,180

English is the official language so

766

00:41:13,549 --> 00:41:11,819

everyone needs to study English

767

00:41:18,530 --> 00:41:13,559

including the Russian cosmonauts too and

768

00:41:21,109 --> 00:41:18,540

they do a great job we were talking on

769

00:41:23,599 --> 00:41:21,119

the space station in English but on the

770

00:41:26,390 --> 00:41:23,609

Soyuz capsule everything is in Russian

771

00:41:29,420 --> 00:41:26,400

because it's their vehicle so all the

772

00:41:31,339 --> 00:41:29,430

panel labels were in Russia and the the

773

00:41:32,180 --> 00:41:31,349

procedures are in Russia and all the

774

00:41:35,329 --> 00:41:32,190

communications

775

00:41:38,680 --> 00:41:35,339

rushon so we needed to learn that

776

00:41:40,640 --> 00:41:38,690

language dude thank you

777

00:41:42,650 --> 00:41:40,650

wonderful we're going to go to Our Lady

778

00:41:56,900 --> 00:41:42,660

of Perpetual Help Catholic school here

779

00:42:02,260 --> 00:41:56,910

for our next question they speak up a

780

00:42:05,569 --> 00:42:02,270

little bit louder our question is what

781

00:42:07,510 --> 00:42:05,579

what was your favorite part of and your

782

00:42:10,309 --> 00:42:07,520

least favorite part of being in space

783

00:42:14,540 --> 00:42:10,319

what was the coolest thing you saw or

784

00:42:16,760 --> 00:42:14,550

did in spaces well I think my favorite

785

00:42:18,440 --> 00:42:16,770

thing is the ability to fly I know I

786

00:42:19,849 --> 00:42:18,450

mean if you guys can look around the

787

00:42:21,319 --> 00:42:19,859

room where you're at right now look at

788

00:42:23,480 --> 00:42:21,329

the ceiling above you just think about

789

00:42:25,370 --> 00:42:23,490

pushing off the ground and floating

790

00:42:27,349 --> 00:42:25,380

right up to the ceiling and then doing a

791

00:42:30,470 --> 00:42:27,359

flip and pushing back down from one wall

792

00:42:32,480 --> 00:42:30,480

to the other flying is awesome I mean

793

00:42:34,130 --> 00:42:32,490

it's really it's like you know it makes

794

00:42:35,870 --> 00:42:34,140

me look at Birds and with a lot of envy

795

00:42:38,230 --> 00:42:35,880

nowadays when I see them zipping around

796

00:42:41,000 --> 00:42:38,240

on on tree branches and stuff like that

797

00:42:43,609 --> 00:42:41,010

flying is really really cool but you

798

00:42:46,670 --> 00:42:43,619

know what else is second part of that is

799

00:42:48,260 --> 00:42:46,680

not only we fly everything flies though

800

00:42:50,480 --> 00:42:48,270

one of the most annoying things about

801
00:42:51,920 --> 00:42:50,490
being in space is losing stuff you know

802
00:42:53,809 --> 00:42:51,930
here we can put you could just put

803
00:42:56,390 --> 00:42:53,819
something down on the table and it'll

804
00:42:58,400 --> 00:42:56,400
it'll be there it'll just stay there up

805
00:43:00,620 --> 00:42:58,410
in space if you just put something for a

806
00:43:03,200 --> 00:43:00,630
moment it's a lot of fun because you

807
00:43:04,760 --> 00:43:03,210
could just drop it it just hovers there

808
00:43:06,559 --> 00:43:04,770
for a little bit you can go do something

809
00:43:09,380 --> 00:43:06,569
and then hopefully when you come back

810
00:43:10,940 --> 00:43:09,390
it's there but nine times out of ten the

811
00:43:13,370 --> 00:43:10,950
air flow in the space station or

812
00:43:14,780 --> 00:43:13,380
somebody's foot comes by and kicks it

813
00:43:16,250 --> 00:43:14,790

and then you're not gonna find this

814

00:43:18,109 --> 00:43:16,260

thing for quite some time because it's

815

00:43:20,839 --> 00:43:18,119

not a life of its own and starts flying

816

00:43:22,790 --> 00:43:20,849

around so that was probably you know

817

00:43:25,040 --> 00:43:22,800

both the the best part in the worst part

818

00:43:27,530 --> 00:43:25,050

is that stuff flies around not only that

819

00:43:29,930 --> 00:43:27,540

like stuff flies in your hair like my

820

00:43:32,030 --> 00:43:29,940

hair was like full of dust you know and

821

00:43:34,130 --> 00:43:32,040

you know when you're eating something

822

00:43:35,089 --> 00:43:34,140

the cracker crumbs go all over the place

823

00:43:36,440 --> 00:43:35,099

so you don't want to have something

824

00:43:37,910 --> 00:43:36,450

that's crummy because then that's gonna

825

00:43:39,980 --> 00:43:37,920

get in your hair and your sleeping bag

826

00:43:42,319 --> 00:43:39,990

and stuff like that so those parts of

827

00:43:44,000 --> 00:43:42,329

the space are something that gets a

828

00:43:46,220 --> 00:43:44,010

little tiresome but you train yourself

829

00:43:47,750 --> 00:43:46,230

and you you know you take some Prakash

830

00:43:50,839 --> 00:43:47,760

so you don't have to worry about that I

831

00:43:53,359 --> 00:43:50,849

think the worst part of living in

832

00:43:55,819 --> 00:43:53,369

station and I think sunny agrees is that

833

00:43:58,130 --> 00:43:55,829

we had to come back home yeah to stay

834

00:44:03,880 --> 00:43:58,140

longer but we have to come back home

835

00:44:06,170 --> 00:44:03,890

that was worse part absolutely thank you

836

00:44:10,040 --> 00:44:06,180

wonderful our next question comes from

837

00:44:15,069 --> 00:44:10,050

Google+ our listen kitano says what is

838

00:44:19,250 --> 00:44:17,660

well the space suit is interesting you

839

00:44:19,730 --> 00:44:19,260

know because it's gonna it could save

840

00:44:22,609 --> 00:44:19,740

your life

841

00:44:25,310 --> 00:44:22,619

the reason we do wear space suits for

842

00:44:28,130 --> 00:44:25,320

launch and entry is just in case

843

00:44:30,460 --> 00:44:28,140

anything happens and the vehicle has a

844

00:44:32,810 --> 00:44:30,470

depressurization so the space suit is

845

00:44:34,790 --> 00:44:32,820

self-contained and make sure you're

846

00:44:36,410 --> 00:44:34,800

gonna be okay in there it's not super

847

00:44:39,319 --> 00:44:36,420

comfortable and neither is the big space

848

00:44:41,329 --> 00:44:39,329

walking soup but they they're it's hard

849

00:44:43,579 --> 00:44:41,339

to make a very safe suit comfortable and

850

00:44:45,829 --> 00:44:43,589

the gloves on all of those suits it's

851

00:44:47,780 --> 00:44:45,839

like if you want to go work on your

852

00:44:50,120 --> 00:44:47,790

computer and you had to wear our garden

853

00:44:51,890 --> 00:44:50,130

gloves all the time it's a little bit

854

00:44:54,410 --> 00:44:51,900

hard you know think about getting on

855

00:44:56,540 --> 00:44:54,420

your BlackBerry or your iPhone with big

856

00:44:59,030 --> 00:44:56,550

gloves on all the time this is it makes

857

00:45:01,099 --> 00:44:59,040

life a little bit troublesome they're

858

00:45:03,319 --> 00:45:01,109

usually a little bit rubbery type of

859

00:45:04,400 --> 00:45:03,329

plastic material to that you know they

860

00:45:07,250 --> 00:45:04,410

have to because they're a pressure

861

00:45:09,410 --> 00:45:07,260

bladder and so they cause a little bit

862

00:45:11,300 --> 00:45:09,420

of sweating and so everybody comes out

863

00:45:12,800 --> 00:45:11,310

of all of those suits just a little bit

864

00:45:15,109 --> 00:45:12,810

of sweaty and a little bit moist and

865

00:45:18,020 --> 00:45:15,119

sort of stinky so that's all it's not so

866

00:45:20,990 --> 00:45:18,030

nice and one other part of this the

867

00:45:22,550 --> 00:45:21,000

thing of course is we get we're in them

868

00:45:23,960 --> 00:45:22,560

for a long period of time you know it

869

00:45:26,150 --> 00:45:23,970

takes a little bit of time to get in

870

00:45:28,280 --> 00:45:26,160

them the launch and entry suits probably

871

00:45:30,500 --> 00:45:28,290

a half an hour each the spacesuit maybe

872

00:45:33,500 --> 00:45:30,510

45 minutes to an hour to actually get in

873

00:45:35,210 --> 00:45:33,510

that thing and so then you don't want to

874

00:45:37,990 --> 00:45:35,220

just put it on and take it off and so

875

00:45:42,079 --> 00:45:38,000

you're in it for a long time which means

876

00:45:44,690 --> 00:45:42,089

no go into the bathroom in a bathroom

877

00:45:46,940 --> 00:45:44,700

you have in all of those spaces who

878

00:45:50,089 --> 00:45:46,950

actually wear a diaper first and then

879

00:45:51,620 --> 00:45:50,099

you put long underwear and then a liquid

880

00:45:54,160 --> 00:45:51,630

cooling garment if you're going to go do

881

00:45:56,120 --> 00:45:54,170

a spacewalk a suit that has water

882

00:45:58,520 --> 00:45:56,130

circulating around it to cool you off

883

00:46:00,860 --> 00:45:58,530

and then the spacesuit goes on top and

884

00:46:03,470 --> 00:46:00,870

so it's multi-layer

885

00:46:06,020 --> 00:46:03,480

it's you know you have your own air that

886

00:46:07,520 --> 00:46:06,030

you're breathing inside so else I'll say

887

00:46:10,130 --> 00:46:07,530

that everything that you do is fairly

888

00:46:13,630 --> 00:46:10,140

self contained in there so don't eat

889

00:46:18,230 --> 00:46:13,640

beans before you put a spacesuit on and

890

00:46:20,570 --> 00:46:18,240

and it's not super super comfortable but

891

00:46:21,860 --> 00:46:20,580

it gets the job done and with their and

892

00:46:28,340 --> 00:46:21,870

they're needed for the things that we're

893

00:46:31,460 --> 00:46:28,350

using them for wonderful our next

894

00:46:34,190 --> 00:46:31,470

question comes from Irish space blog on

895

00:46:35,840 --> 00:46:34,200

Twitter Aki and sunny did the cupola

896

00:46:37,820 --> 00:46:35,850

make your overall spaceflight experience

897

00:46:43,640 --> 00:46:37,830

more enjoyable compared to previous

898

00:46:46,910 --> 00:46:43,650

flights yes it's a dangerous place that

899

00:46:48,710 --> 00:46:46,920

window that is a dangerous place in the

900

00:46:50,870 --> 00:46:48,720

space station I call it a black hole

901
00:46:52,870 --> 00:46:50,880
because you think hey I'll I'll take a

902
00:46:55,940 --> 00:46:52,880
peek outside the window for ten minutes

903
00:46:57,920 --> 00:46:55,950
you're stuck there for two hours you'd

904
00:47:01,040 --> 00:46:57,930
love it as you love it it's just

905
00:47:02,900 --> 00:47:01,050
gorgeous you see things fly by you know

906
00:47:07,100 --> 00:47:02,910
and then there's the next thing coming

907
00:47:09,140 --> 00:47:07,110
by you see deserts you see ocean you see

908
00:47:11,990 --> 00:47:09,150
mountains you see the night lights and

909
00:47:14,960 --> 00:47:12,000
it's just gorgeous and you can't leave

910
00:47:21,950 --> 00:47:14,970
so it is a dangerous place but we just

911
00:47:23,660 --> 00:47:21,960
loved it absolutely wonderful then our

912
00:47:26,300 --> 00:47:23,670
next question comes from Google+ here

913
00:47:28,760 --> 00:47:26,310

Patricia Fay asks are you fans of some

914

00:47:30,290 --> 00:47:28,770

of the science fiction genre or is your

915

00:47:36,590 --> 00:47:30,300

experience in space even better than

916

00:47:38,810 --> 00:47:36,600

fiction well I grew up watching Star

917

00:47:43,040 --> 00:47:38,820

Trek Star Wars you know I have a science

918

00:47:47,180 --> 00:47:43,050

fiction geek but you know it's one thing

919

00:47:48,980 --> 00:47:47,190

to watch those and imagine things and

920

00:47:52,520 --> 00:47:48,990

it's another to actually get to

921

00:47:55,580 --> 00:47:52,530

experience it I think everyone should go

922

00:47:58,460 --> 00:47:55,590

to space and experience it on their own

923

00:48:01,460 --> 00:47:58,470

because it's it's not the same as in

924

00:48:08,660 --> 00:48:01,470

your imagined so it's it's really cool

925

00:48:12,539 --> 00:48:10,799

wonderful then for our online audience

926

00:48:14,099 --> 00:48:12,549

at home just a reminder that we're

927

00:48:17,069 --> 00:48:14,109

taking real-time questions using the

928

00:48:18,750 --> 00:48:17,079

hashtag pound to ask NASA on Twitter or

929

00:48:20,940 --> 00:48:18,760

we're taking them from our NASA Google+

930

00:48:22,710 --> 00:48:20,950

page we've also opened a comment thread

931

00:48:24,029 --> 00:48:22,720

for everybody on our NASA Facebook page

932

00:48:25,890 --> 00:48:24,039

where you can post your questions as

933

00:48:30,000 --> 00:48:25,900

well our next question is going to come

934

00:48:31,980 --> 00:48:30,010

from the Dalton Intermediate School my

935

00:48:34,079 --> 00:48:31,990

name is Kari I am an eighth grader at

936

00:48:36,089 --> 00:48:34,089

the Downton Intermediate School do you

937

00:48:39,720 --> 00:48:36,099

have any free time in the space station

938

00:48:45,359 --> 00:48:39,730

if you do what do you like to do do you

939

00:48:46,920 --> 00:48:45,369

have any fun of course we have fun we do

940

00:48:49,470 --> 00:48:46,930

have a little bit of free time every now

941

00:48:51,049 --> 00:48:49,480

and then yeah it wasn't all work up

942

00:48:53,970 --> 00:48:51,059

there wasn't all serious all the time

943

00:48:56,940 --> 00:48:53,980

and actually the work is really just fun

944

00:48:58,770 --> 00:48:56,950

anyway but we did try to have a normal

945

00:49:00,450 --> 00:48:58,780

day like I talked about we sort of got

946

00:49:03,450 --> 00:49:00,460

up at 6 o'clock in the morning started

947

00:49:05,609 --> 00:49:03,460

work around 7:00 7:30 and worked around

948

00:49:07,589 --> 00:49:05,619

it worked until around 6 o'clock at

949

00:49:09,240 --> 00:49:07,599

night 5 or 6 o'clock at night and then

950

00:49:12,059 --> 00:49:09,250

we had a little free time before we went

951
00:49:14,339 --> 00:49:12,069
to bed around 10 o'clock and so we ate

952
00:49:16,920 --> 00:49:14,349
dinner together we actually sort of

953
00:49:20,640 --> 00:49:16,930
gathered around a computer to watch some

954
00:49:23,640 --> 00:49:20,650
TV shows while we're eating dinner just

955
00:49:24,900 --> 00:49:23,650
sort of like a just a group thing to get

956
00:49:26,640 --> 00:49:24,910
together it's sort of just like at home

957
00:49:28,529 --> 00:49:26,650
we watched a little diners drive-ins and

958
00:49:31,019 --> 00:49:28,539
dives every now and then everything

959
00:49:33,210 --> 00:49:31,029
Italian just to sort of watch other

960
00:49:34,740 --> 00:49:33,220
people make some good food and just some

961
00:49:36,960 --> 00:49:34,750
some funny shows like that and sometimes

962
00:49:38,940 --> 00:49:36,970
the news you know we watched actually

963
00:49:40,230 --> 00:49:38,950

the Olympics while we were up there for

964

00:49:41,640 --> 00:49:40,240

part of the time we would get the

965

00:49:44,339 --> 00:49:41,650

highlights of the Olympics we watched

966

00:49:47,880 --> 00:49:44,349

part of the football season and as well

967

00:49:49,079 --> 00:49:47,890

on Sundays we also but you know you

968

00:49:50,460 --> 00:49:49,089

don't want to spend your time looking at

969

00:49:52,170 --> 00:49:50,470

a computer is that type of stuff while

970

00:49:53,789 --> 00:49:52,180

you're up in space so there's a lot of

971

00:49:55,500 --> 00:49:53,799

other cool things you can do you can do

972

00:49:57,450 --> 00:49:55,510

some of your own experiments with water

973

00:50:00,059 --> 00:49:57,460

or things that you brought up there

974

00:50:01,529 --> 00:50:00,069

I wrote a journal while I was there and

975

00:50:04,859 --> 00:50:01,539

of course looking out the window and

976

00:50:07,680 --> 00:50:04,869

taking pictures and talking to friends

977

00:50:09,750 --> 00:50:07,690

and family at home we have email as well

978

00:50:11,819 --> 00:50:09,760

as a phone that we're able to call home

979

00:50:13,319 --> 00:50:11,829

and talk to folks at home and wish

980

00:50:15,480 --> 00:50:13,329

people happy birthdays and stuff like

981

00:50:17,339 --> 00:50:15,490

that so we did spend a lot you know

982

00:50:22,500 --> 00:50:17,349

times trying to communicate with folks

983

00:50:26,620 --> 00:50:24,760

so a couple of things that you mentioned

984

00:50:27,700 --> 00:50:26,630

there are actually dovetail right into

985

00:50:29,620 --> 00:50:27,710

and one of our questions that we have

986

00:50:31,390 --> 00:50:29,630

from one of our Facebook users here so

987

00:50:32,620 --> 00:50:31,400

many days what kind of work did you do

988

00:50:33,640 --> 00:50:32,630

what experiments did you actually

989

00:50:38,860 --> 00:50:33,650

conduct while you were on the

990

00:50:41,380 --> 00:50:38,870

International Space Station so there was

991

00:50:43,960 --> 00:50:41,390

never a dull moment up or when we were

992

00:50:46,270 --> 00:50:43,970

there so we had EVA you know spacewalks

993

00:50:48,850 --> 00:50:46,280

so we had to prepare for it we had so

994

00:50:52,900 --> 00:50:48,860

many different visiting vehicles like

995

00:50:56,290 --> 00:50:52,910

the Japanese vehicle European the u.s.

996

00:50:59,590 --> 00:50:56,300

dragon vehicle and also a couple of

997

00:51:01,810 --> 00:50:59,600

progress vehicles from Russia and on top

998

00:51:05,530 --> 00:51:01,820

of that we did have a lot of different

999

00:51:07,180 --> 00:51:05,540

experiment you know medical science we

1000

00:51:12,250 --> 00:51:07,190

got to take our own blood and urine

1001
00:51:17,860 --> 00:51:12,260
samples we had like oh yeah that we had

1002
00:51:22,470 --> 00:51:17,870
got to uh look at our eyes using like

1003
00:51:26,740 --> 00:51:22,480
ultrasound and other stuff we did deploy

1004
00:51:28,780 --> 00:51:26,750
some satellites from station the Russian

1005
00:51:33,700 --> 00:51:28,790
side did it during their spacewalk

1006
00:51:36,130 --> 00:51:33,710
it was a huge sphere like maybe that big

1007
00:51:38,100 --> 00:51:36,140
and they they went outside with that

1008
00:51:40,630 --> 00:51:38,110
sphere and then they just tossed it out

1009
00:51:43,540 --> 00:51:40,640
they did it that way

1010
00:51:45,970 --> 00:51:43,550
we had another way of doing that on the

1011
00:51:48,700 --> 00:51:45,980
Japanese side we had a satellite

1012
00:51:51,820 --> 00:51:48,710
deployer which is like a just a box with

1013
00:51:53,770 --> 00:51:51,830

a spring at the end so you open the door

1014

00:51:56,680 --> 00:51:53,780

and then that spring force just pushes

1015

00:51:59,320 --> 00:51:56,690

out a small satellites outside so we did

1016

00:52:03,280 --> 00:51:59,330

it that way too and we had a couple of

1017

00:52:07,150 --> 00:52:03,290

creatures Sonny had spiders I had fishes

1018

00:52:09,370 --> 00:52:07,160

both for experiment for the fish we used

1019

00:52:15,610 --> 00:52:09,380

them to see the effect of microgravity

1020

00:52:18,460 --> 00:52:15,620

on bone density and muscle so they were

1021

00:52:22,000 --> 00:52:18,470

up there for two months and then B I

1022

00:52:23,890 --> 00:52:22,010

think they're all back down on earth so

1023

00:52:26,080 --> 00:52:23,900

the investigators will take a look at it

1024

00:52:28,240 --> 00:52:26,090

and compare with the fishes on the

1025

00:52:31,740 --> 00:52:28,250

ground and see if there's any any

1026

00:52:35,710 --> 00:52:33,880

wonderful we're going to go back to

1027

00:52:51,700 --> 00:52:35,720

Our Lady of Perpetual Help Catholic

1028

00:52:53,710 --> 00:52:51,710

school for the next question and our

1029

00:52:56,200 --> 00:52:53,720

question is what inspired you to become

1030

00:53:01,840 --> 00:52:56,210

an astronaut and what made you want to

1031

00:53:03,010 --> 00:53:01,850

be a scientist okay so hey you know I

1032

00:53:04,810 --> 00:53:03,020

didn't think about being an astronaut

1033

00:53:06,460 --> 00:53:04,820

till quite some time you know not

1034

00:53:08,350 --> 00:53:06,470

definitely not when I was your age I had

1035

00:53:11,080 --> 00:53:08,360

never met anybody who had been an

1036

00:53:13,270 --> 00:53:11,090

astronaut or actually really been in the

1037

00:53:14,590 --> 00:53:13,280

military except for my brother who went

1038

00:53:17,230 --> 00:53:14,600

to the Naval Academy a couple of years

1039

00:53:19,900 --> 00:53:17,240

before I did so I didn't really think

1040

00:53:22,690 --> 00:53:19,910

about it too much I I liked science and

1041

00:53:24,190 --> 00:53:22,700

math so engineering seemed to be a good

1042

00:53:26,800 --> 00:53:24,200

fit for me

1043

00:53:29,260 --> 00:53:26,810

so I went into general engineering and

1044

00:53:30,820 --> 00:53:29,270

went to the Naval Academy and started

1045

00:53:32,590 --> 00:53:30,830

flying helicopters right after that

1046

00:53:34,720 --> 00:53:32,600

still never thought about being an

1047

00:53:36,940 --> 00:53:34,730

astronaut until I had the opportunity to

1048

00:53:40,930 --> 00:53:36,950

go down to Johnson Space Center and meet

1049

00:53:44,140 --> 00:53:40,940

John Young who happily happened to have

1050

00:53:47,020 --> 00:53:44,150

flown a vertical landing type of space

1051
00:53:48,610 --> 00:53:47,030
aircraft to practice landing on the moon

1052
00:53:50,560 --> 00:53:48,620
and I thought wow well I'm doing that

1053
00:53:51,790 --> 00:53:50,570
flying helicopter so maybe I had the

1054
00:53:54,280 --> 00:53:51,800
same type of skills that some of these

1055
00:53:56,080 --> 00:53:54,290
guys have because I wanted to go back to

1056
00:53:58,840 --> 00:53:56,090
the moon and land on the moon so it

1057
00:54:00,430 --> 00:53:58,850
wasn't until later on in my life that I

1058
00:54:04,630 --> 00:54:00,440
thought wow maybe I could be an

1059
00:54:07,060 --> 00:54:04,640
astronaut science I love science it's it

1060
00:54:09,580 --> 00:54:07,070
came somewhat natural to me my dad was a

1061
00:54:11,530 --> 00:54:09,590
doctor and a research scientist so he

1062
00:54:13,360 --> 00:54:11,540
used to take us to his laboratory when

1063
00:54:15,070 --> 00:54:13,370

we were young kids and we looked through

1064

00:54:17,290 --> 00:54:15,080

the electron microscope and I think I

1065

00:54:21,310 --> 00:54:17,300

was having a curious mind in questioning

1066

00:54:22,330 --> 00:54:21,320

why and how does that work is is one of

1067

00:54:24,640 --> 00:54:22,340

those things that sort of came naturally

1068

00:54:26,500 --> 00:54:24,650

and or and actually maybe even just

1069

00:54:29,710 --> 00:54:26,510

taught because I think I heard it quite

1070

00:54:31,900 --> 00:54:29,720

a bit from my dad and his friends so I

1071

00:54:33,820 --> 00:54:31,910

would encourage all of you to do that

1072

00:54:35,620 --> 00:54:33,830

and I think when you start probing in

1073

00:54:37,480 --> 00:54:35,630

for the answers you might not always

1074

00:54:39,490 --> 00:54:37,490

find a satisfactory answer one that you

1075

00:54:41,800 --> 00:54:39,500

understand so I keep asking the question

1076

00:54:45,750 --> 00:54:41,810

and again and I'll bet you you will

1077

00:54:52,180 --> 00:54:50,770

thank you.thank wonderful we've got time

1078

00:54:56,220 --> 00:54:52,190

for just a couple more questions here

1079

00:55:01,030 --> 00:54:56,230

our next question comes from Facebook

1080

00:55:02,410 --> 00:55:01,040

from Theresa the Minsky Meijer sunny I

1081

00:55:03,790 --> 00:55:02,420

was wondering if your body felt it's

1082

00:55:06,250 --> 00:55:03,800

only after running the Boston Marathon

1083

00:55:07,570 --> 00:55:06,260

in space as it would on the ground for

1084

00:55:11,410 --> 00:55:07,580

instance did you have the same kind of

1085

00:55:13,750 --> 00:55:11,420

muscle soreness you know that's a really

1086

00:55:16,360 --> 00:55:13,760

interesting question because running on

1087

00:55:18,310 --> 00:55:16,370

the treadmill up there as I was building

1088

00:55:19,810 --> 00:55:18,320

up toward the marathon I didn't and I

1089

00:55:21,550 --> 00:55:19,820

was thinking to myself wow this is

1090

00:55:25,240 --> 00:55:21,560

interesting I'm not really getting as

1091

00:55:27,250 --> 00:55:25,250

sore but then as I started doing some

1092

00:55:29,500 --> 00:55:27,260

longer runs which took like an hour to

1093

00:55:31,150 --> 00:55:29,510

two hours to three hours I was like oh

1094

00:55:33,460 --> 00:55:31,160

you know now I'm finally getting that

1095

00:55:36,160 --> 00:55:33,470

soreness the same one back again and I

1096

00:55:37,930 --> 00:55:36,170

think part of the process there is and

1097

00:55:40,180 --> 00:55:37,940

then let me just say one other thing too

1098

00:55:43,530 --> 00:55:40,190

when I finished the marathon I

1099

00:55:47,080 --> 00:55:43,540

definitely had particularly you know

1100

00:55:48,970 --> 00:55:47,090

soreness on my thighs typical of what

1101
00:55:51,220 --> 00:55:48,980
you get back on earth when you're

1102
00:55:52,960 --> 00:55:51,230
running a marathon but if white all of

1103
00:55:55,060 --> 00:55:52,970
that went away really quickly you know

1104
00:55:56,620 --> 00:55:55,070
here on earth after you run you have all

1105
00:55:58,240 --> 00:55:56,630
that lactic acid built up in your

1106
00:56:00,340 --> 00:55:58,250
muscles and then you're still walking

1107
00:56:02,410 --> 00:56:00,350
around and having to go upstairs and

1108
00:56:05,410 --> 00:56:02,420
things like that and so it really feels

1109
00:56:07,540 --> 00:56:05,420
like it hurts but in space automatically

1110
00:56:09,520 --> 00:56:07,550
right if it's running you're floating

1111
00:56:12,670 --> 00:56:09,530
again and so your muscles are recovering

1112
00:56:14,080 --> 00:56:12,680
really quickly and so actually I thought

1113
00:56:16,600 --> 00:56:14,090

to myself I'm never getting on that darn

1114

00:56:18,430 --> 00:56:16,610

treadmill again but by the next day my

1115

00:56:20,650 --> 00:56:18,440

muscles felt fine and I was able to get

1116

00:56:22,780 --> 00:56:20,660

right back on it again so I think the

1117

00:56:24,490 --> 00:56:22,790

recovery process of not having to keep

1118

00:56:26,980 --> 00:56:24,500

that pounding going like we do here on

1119

00:56:30,360 --> 00:56:26,990

earth helps you with with that quite a

1120

00:56:35,350 --> 00:56:32,500

wonderful our next question comes from

1121

00:56:37,510 --> 00:56:35,360

Twitter from jail Oakley what is the

1122

00:56:39,610 --> 00:56:37,520

danger of space junk is there a project

1123

00:56:41,530 --> 00:56:39,620

to map it what kind of danger does it

1124

00:56:45,310 --> 00:56:41,540

pose to Earth in any way of future space

1125

00:56:48,310 --> 00:56:45,320

flights well there's a lot of garbage

1126
00:56:51,880 --> 00:56:48,320
around earth right now if those are from

1127
00:56:55,420 --> 00:56:51,890
like rockets dead satellites and a lot

1128
00:56:58,480 --> 00:56:55,430
of other things but for a space station

1129
00:56:59,650 --> 00:56:58,490
we're kind of tracking something which

1130
00:57:03,039 --> 00:56:59,660
is larger than

1131
00:57:05,470 --> 00:57:03,049
or inches and that's from the ground so

1132
00:57:08,140 --> 00:57:05,480
we know the trajectory and if that

1133
00:57:11,559 --> 00:57:08,150
coincides with the station's trajectory

1134
00:57:14,890 --> 00:57:11,569
we know ahead of time usually and we

1135
00:57:16,750 --> 00:57:14,900
will know that hey if we go on this path

1136
00:57:19,299 --> 00:57:16,760
we're gonna hit it or they're gonna hit

1137
00:57:22,990 --> 00:57:19,309
it hit us so what we do in that case is

1138
00:57:26,230 --> 00:57:23,000

we burn our engine a little bit so that

1139

00:57:31,049 --> 00:57:26,240

we change our latitude and then that way

1140

00:57:32,410 --> 00:57:31,059

it will miss us now if it's smaller than

1141

00:57:35,230 --> 00:57:32,420

half an inch

1142

00:57:37,359 --> 00:57:35,240

one centimeter and it's not gonna

1143

00:57:39,760 --> 00:57:37,369

penetrate the whole of the station so

1144

00:57:43,180 --> 00:57:39,770

it's designed that way so that it's

1145

00:57:45,339 --> 00:57:43,190

protected now the problem is the size

1146

00:57:47,260 --> 00:57:45,349

between that so 1 centimeters to 10

1147

00:57:50,440 --> 00:57:47,270

centimeters you can't detect it you

1148

00:57:52,930 --> 00:57:50,450

can't you can't watch where it's going

1149

00:57:55,920 --> 00:57:52,940

and if it hit station then it's gonna

1150

00:58:00,069 --> 00:57:55,930

make a hole so what do we do the

1151
00:58:02,859 --> 00:58:00,079
probability is very low but we do train

1152
00:58:04,599 --> 00:58:02,869
for the worst case so if it hits we're

1153
00:58:07,420 --> 00:58:04,609
going to have depressurization onboard

1154
00:58:10,000 --> 00:58:07,430
the space station so we are trained we

1155
00:58:12,339 --> 00:58:10,010
have procedures we're trained on the

1156
00:58:14,710 --> 00:58:12,349
onboard as well as all the flight

1157
00:58:18,490 --> 00:58:14,720
controllers on the ground they are

1158
00:58:20,980 --> 00:58:18,500
trained and we we do train together in

1159
00:58:26,109 --> 00:58:20,990
some cases so we know what to do to save

1160
00:58:27,910 --> 00:58:26,119
ourselves wonderful this is gonna be our

1161
00:58:29,589 --> 00:58:27,920
final question for this Google+ hangout

1162
00:58:33,339 --> 00:58:29,599
here this comes from Twitter user Mike's

1163
00:58:35,559 --> 00:58:33,349

0-3 what role could the ISS play on the

1164

00:58:40,150 --> 00:58:35,569

future of human space travel including a

1165

00:58:42,339 --> 00:58:40,160

manned Mars mission well the space

1166

00:58:45,069 --> 00:58:42,349

station is a really great platform right

1167

00:58:54,320 --> 00:58:45,079

now because it's sort of a testbed we

1168

00:58:59,640 --> 00:58:57,960

but we try out all sorts of interesting

1169

00:59:02,490 --> 00:58:59,650

experiments like you guys talked about

1170

00:59:14,040 --> 00:59:02,500

capillary flow experiments to hopefully

1171

00:59:17,940 --> 00:59:14,050

design better fuel tanks for future

1172

00:59:19,740 --> 00:59:17,950

spacecraft all the material science we

1173

00:59:21,360 --> 00:59:19,750

actually did some burning science up

1174

00:59:23,340 --> 00:59:21,370

there where we burn different materials

1175

00:59:25,260 --> 00:59:23,350

to try to figure out how to build a

1176

00:59:27,840 --> 00:59:25,270

spacecraft that may be in microgravity

1177

00:59:31,200 --> 00:59:27,850

won't burn so we're using the space

1178

00:59:32,880 --> 00:59:31,210

station right now as a testbed for all

1179

00:59:36,210 --> 00:59:32,890

of these different pieces and parts that

1180

00:59:38,610 --> 00:59:36,220

will get smarter and on or make it more

1181

00:59:39,900 --> 00:59:38,620

efficient more better the things that

1182

00:59:42,750 --> 00:59:39,910

we're learning to make a better better

1183

00:59:45,270 --> 00:59:42,760

smarter spacecraft for you guys in the

1184

00:59:48,270 --> 00:59:45,280

future now a space station also could be

1185

00:59:50,430 --> 00:59:48,280

a platform we try out new spacecraft as

1186

00:59:51,720 --> 00:59:50,440

well we're actually moving some modules

1187

00:59:54,240 --> 00:59:51,730

around or we're planning to in the

1188

00:59:56,880 --> 00:59:54,250

future to provide more docking ports for

1189

01:00:00,090 --> 00:59:56,890

more potentially experimental type of

1190

01:00:01,290 --> 01:00:00,100

spacecraft to come up and join us on top

1191

01:00:03,990 --> 01:00:01,300

of that I think there's a the

1192

01:00:06,570 --> 01:00:04,000

international cooperation aspect right

1193

01:00:08,490 --> 01:00:06,580

now US Russia European countries Canada

1194

01:00:12,150 --> 01:00:08,500

and Japan are cooperating for the

1195

01:00:14,730 --> 01:00:12,160

international space station the space

1196

01:00:17,070 --> 01:00:14,740

station program will end eventually but

1197

01:00:19,980 --> 01:00:17,080

that cooperation that relationship the

1198

01:00:23,190 --> 01:00:19,990

partnership that will go on to the next

1199

01:00:29,490 --> 01:00:23,200

space program so we can help out each

1200

01:00:31,440 --> 01:00:29,500

other and that's in that way - wonderful

1201

01:00:33,000 --> 01:00:31,450

thank you very much for taking time to

1202

01:00:34,440 --> 01:00:33,010

sit down and answer all of these

1203

01:00:36,390 --> 01:00:34,450

questions today thank you to the two

1204

01:00:38,580 --> 01:00:36,400

schools for joining us and so on this

1205

01:00:40,380 --> 01:00:38,590

concludes today's Google+ hangout for

1206

01:00:42,960 --> 01:00:40,390

more information about the space station

1207

01:00:44,700 --> 01:00:42,970

research in low-earth orbit NASA's

1208

01:00:52,160 --> 01:00:44,710

commercial space programs in the future

1209

01:00:52,170 --> 01:01:02,900

www.ccltss.org or

1210

01:01:07,160 --> 01:01:05,870

/ the plus symbol and then NASA thank

1211

01:01:11,210 --> 01:01:07,170

you for your questions and thank you all